

Section 1: Rehabilitation and Secondary Prevention of Cardiovascular Disease

Cardiovascular Disease

Cardiovascular disease is a broad term that encompasses a range of conditions including coronary heart disease (CHD), stroke, heart failure (HF), peripheral vascular disease and other diseases of the heart, arteries and veins. Cardiovascular disease is the major cause of morbidity and mortality in Australia accounting for over 50,000 deaths in 2002¹.

In 2001 it was estimated that cardiovascular disease affected 3.67 million Australians, with CHD, the most common form of cardiovascular disease, accounting for approximately 10% of this morbidity. Survival following a diagnosis of CHD has improved significantly over the past decades in Australia and elsewhere and a recent study suggests that approximately half of this decline can be attributed to evidence based medical therapies, including rehabilitation and secondary prevention strategies, and approximately half to reductions in major risk factors². There remain a large number of people living with this and other diseases of the cardiovascular system.

In 2004-2005 there were 451,700 hospital separations in public and private hospitals in Australia with a principal diagnosis of a disease of the circulatory system³. Of these, 80,229 hospitalisations were for angina, 47,633 for acute myocardial infarction, 41,322 for heart failure and 33,733 for chronic ischaemic heart disease.

The impact of a diagnosis of a disease of the cardiovascular system and the adjustment required for an individual should not be underestimated despite the remarkable achievements in management of these diseases and the improvement in survival. Individuals and their families will benefit from a system of support to them to allow return to a satisfactory lifestyle within the limitations of their disease in a safe, effective and timely manner. The responsibility to provide this system of support is shared by providers and health practitioners in the public, private and community health systems.

Rehabilitation and Secondary Prevention

Cardiac rehabilitation (CR) is a process that seeks to provide a coordinated system of support that allows a person with cardiac disease to return to a satisfactory lifestyle and aims to

prevent the recurrence of further cardiovascular events by improving self-efficacy and promoting favourable behaviour change. Secondary prevention is an integral part of the rehabilitation process. Successful rehabilitation and secondary prevention can be achieved by using a number of strategies designed to improve the outcome for an individual and involving the combined use of medical, psychological, educational, vocational and physical measures with a multi-professional approach.

The development of Cardiac Rehabilitation in Australia

In 1961, the Heart Foundation established CR units in Sydney and Melbourne involving a medical officer and social worker. The Heart Foundation ceased operating these units in the early 1970s and the hospitals where they were based took them over. The Heart Foundation then established an advisory committee to promote the development of CR more widely throughout Australian hospitals. In 1981, the World Health Organisation (WHO) released a statement regarding the prevention of the recurrence and progression of CHD with emphasis on the need to address the risk factors that resulted in the initial cardiac event, acknowledging that CHD is progressive and that a substantial proportion of CHD deaths occur in people with existing disease. A national survey undertaken in Australia during 1984 and 1985 to investigate the availability, content and structure of CR, revealed that 26 hospitals (17%) provided outpatient group exercise programs in three states, and 36 hospitals (24%) provided outpatient group education programs, with all 153 hospitals eligible for the survey responding⁴. Education officers were subsequently employed by the Heart Foundation in the states of New South Wales and Victoria and health professional resource material to promote the establishment of CR services was developed. In 1988, the World Congress of CR, held in Queensland, Australia, led to the development and incorporation of national and state health professional associations for CR which have played a lead role in the promotion of CR throughout Australia. The impetus to promote CR in Australia was further enhanced at this time by the publication of the first meta-analysis of randomised controlled trials of CR in 1988⁵ suggesting a survival benefit from attending outpatient CR.

In 1993, WHO's Expert Committee on Rehabilitation after Cardiovascular Disease released a report which stated⁶:

"CR should be an integral component of the long-term, comprehensive care of cardiac patients. CR programs or services should be available to all patients with cardiovascular

disease. Rehabilitation services should be provided by any trained health professional caring for cardiac patients, since no sophisticated equipment or facilities are required. Both patients and their families should participate."

The National Medical, Scientific and Education Advisory Committee of the National Heart Foundation of Australia simultaneously released the following policy statement⁷:

"Secondary prevention programs, including outpatient CR, should be available to all patients in Australia who have had acute myocardial infarction, coronary artery bypass grafts, coronary angioplasty or other cardiovascular disease. Unless contraindicated, these patients should be routinely referred to hospital or community-based outpatient programs."

In 1994, the American Heart Association published a position statement on CR programs outlining the major issues within each of the components of CR⁸ stating that CR programs should consist of a multi-faceted and multidisciplinary approach to overall cardiovascular risk reduction and that programs consisting of exercise training alone were not considered CR. Indications for referral to CR were CHD, acute myocardial infarction (AMI), coronary artery bypass grafts (CABG), cardiac transplantation, heart failure, angioplasty and valvular surgery.

In 1995, the Agency for Health Care Policy and Research in the United States released Clinical Practice Guidelines⁹ stating that CR services were widely under-used in spite of their proven benefits. These guidelines were developed following an extensive systematic review of the scientific evidence relevant to CR for the period 1966 to 1995 and included 114 reports on trials of the effects of CR exercise training and seven reports on educational, counselling and behavioural interventions. This was followed by a position statement on the measurement of health, clinical and behavioural outcomes following CR from the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR)¹⁰.

In 1997, New South Wales Health developed policy standards for CR aimed at improving state-wide cardiac care and outcomes¹¹ with service agreements regarding implementation between area health service executive officers and the state department of health. The development of these standards followed a systematic review of randomised and non-randomised trials, utilising the earlier review undertaken by the US Agency for Health Care Policy and Research. The first policy standard stated that *"all cardiac patients should have access to a comprehensive CR program and should be referred on discharge from hospital"*.

In 1998, the Heart Foundation of Australia produced a health professional statement on recommendations for CR¹² which was subsequently updated in 2004 in conjunction with ACRA to produce a recommended framework for CR¹³. In 1999, ACRA released the first edition of *A Practitioner's Guide to Cardiac Rehabilitation* with a focus on program planning, administration, implementation and evaluation¹⁴.

The Heart Research Centre, commissioned by the Department of Human Services in Victoria, produced best practice guidelines for CR and secondary prevention in 1999¹⁵. Based on a review of the scientific evidence and authoritative opinions, recommendations for optimal standards for simple and low cost CR were produced in order to improve the availability of CR programs.

In the year 2000, the American Heart Association and the American Association of Cardiovascular and Pulmonary Rehabilitation released a joint scientific statement of the core components of CR and secondary prevention programs, with recommended evaluation, interventions and expected outcomes¹⁶, and the British National Health Service produced a national service framework for CR¹⁷. The American Heart Association released secondary prevention guidelines advocating medically supervised exercise programs for patients at moderate to high risk in 2001¹⁸, and updated its 1994 position statement on CR in 2005 with emphasis on the exercise training component¹⁹

Since the time of the national survey in 1984 the availability of outpatient services in Australia has grown substantially with the National Heart Foundation's 2001 Directory of Australian CR programs²⁰ listing a total of 265 programs available in all states and territories. The challenge remains to maximise the use of existing services, identify processes that encourage access to appropriate services and provide well trained health professionals to meet the needs of people with cardiovascular disease.

In 2005 the The National Health and Medical Research Council (NHMRC) released a practical guide for health professionals on *Strengthening Cardiac Rehabilitation and Secondary Prevention for Aboriginal and Torres Strait Islander Peoples*. This document addresses the cultural complexities of Aboriginal and Torres Strait Islander Peoples recovery from cardiac problems and provides practical information for people with cardiac disease, health professionals and managers²¹. In 2006, NSW Health released a policy document²² and

a guideline document²³ outlining the expectation of CR and related services in the New South Wales public health system. In 2007 a cardiac geographic information system CD-ROM which can be used in conjunction with the above guide was released by NHMRC to locate CR services for Indigenous Australians across Australia and aid understanding of the distribution of cardiac illness in local areas²⁴.

Biology and the theory for why cardiac rehabilitation works

Comprehensive cardiac rehabilitation involves several overlapping approaches including educational, behavioural, psychological and physical components; therefore the exact mechanism of any benefit is difficult to determine. There is some evidence that the mortality benefit may be mediated primarily through exercise as no mortality benefit has been demonstrated with educational programs alone²⁵. Comprehensive CR including education and counselling in addition to exercise training has been demonstrated to have a greater mortality benefit compared with exercise only CR. However this has recently been challenged²⁶.

Cardiac rehabilitation has been shown to improve physical exercise capacity. However improvement in physical exercise capacity occurs gradually following AMI without exercise training²⁷. Greater improvements can be expected in individuals with initial low levels of fitness²⁸. Exercise training in people with CHD includes predominantly peripheral adaptations, and although primary cardiac effects may occur through a number of mechanisms which translates into direct benefits on the heart, improvement in coronary vasculature, endothelial function, autonomic tone, coagulation and clotting factors, inflammatory markers and development of collateral circulation²⁹, this has not been demonstrated conclusively and may be related to the duration of exercise training³⁰.

In addition, exercise training has an impact on a number of the major risk factors for CHD. Regular exercise has been shown to prevent hypertension and reduce resting blood pressure, increase high density lipoproteins thereby improving lipid profiles, prevent the development of diabetes and improve insulin uptake and help with the maintenance of a healthy weight.

Cardiac rehabilitation may also be effective as it provides regular supervision by skilled staff with the ability to recognise clinical instability or deterioration during a time when there is a high risk of death or other adverse events, particularly following recent AMI or unstable angina. It is possible that the mechanism of benefit is also related to education, not limited to

risk factors and behaviour change, but more broadly to education about the importance of medical therapy in the prevention of further cardiac events and the need to manage the development of symptoms of CHD in a timely and ongoing manner.

Cardiac Rehabilitation Effectiveness

Throughout the 1970s and 1980s, a number of clinical trials were undertaken to establish the effectiveness of CR in terms of morbidity and mortality. However many of the trials included people following AMI at low risk of further cardiac events, and while a reduction in deaths was demonstrated they were underpowered to detect a significant difference in terms of mortality^{31,32,33}. Since this time a number of meta-analyses of randomised controlled trials comparing outpatient cardiac rehabilitation with usual care have been undertaken. The results from these studies were consistent, with the pooled odds ratios for all-cause-mortality and cardiac mortality ranging from 0.68 to 0.87 and 0.62 to 0.78, respectively, suggesting a significantly lower risk of death from participation in cardiac rehabilitation compared to no participation^{34, 35, 36, 37}.

Most of the trials included in the meta-analyses involved participants under the age of 70 years and were mostly male. Therefore the generalisability of these results to the elderly and to females has been questioned. The exercise data from a study of patients aged 62 years or older confirmed that CR is effective in older women and older men in terms of increasing exercise capacity³⁸. However trials assessing mortality in these sub-groups are not available.

Many of the trials undertaken involved high intensity exercise training, and in 1991 a randomised trial in Melbourne, Victoria demonstrated that low intensity exercise programs had similar benefits to higher intensity programs in men aged less than 70 years following transmural AMI³⁹. There was no difference in exercise capacity at baseline or at 12 months between the low intensity and high intensity groups. However there was a significant difference in exercise capacity favouring the high intensity group at program exit. In addition there was no difference in measurements of quality of life between low and high intensity exercise⁴⁰.

One of the challenges in assessing the benefits of CR by comparing trials is there is no one accepted model in terms of time of commencement, eligibility, duration, content and structure. Trial conditions are also often not able to be generalised to a broader group of

people with cardiac disease attending outpatient CR. The generalisability of these findings to an Australian population is limited due to the differences in access, structure, content, duration and selection of participants for CR. Only one of the trials included in the meta-analyses above involved an Australian population (Hare et al 1983).

It is important to note that effectiveness has been evaluated in services available at an outpatient level. To establish effectiveness requires a large sample of people willing to participate in a controlled trial and the cost of undertaking such a trial is prohibitive. The effectiveness of a number of models of care commonly used today in Australia and elsewhere has not been formally evaluated. This does not negate the benefit of these models; however providers and health practitioners should be mindful of the evidence.

The benefits of cardiac rehabilitation as summarised in the Cardiac Rehabilitation Clinical Practice Guidelines (AACVPR) are:

Increased exercise tolerance: (NHMHRC Level II evidence)

Cardiac rehabilitation exercise training improves objective measures of exercise tolerance in both men and women, including elderly patients, with coronary heart disease (CHD) and with heart failure. Maintenance of exercise training is required to sustain improvement in exercise tolerance.

Improved symptoms: (NHMHRC Level II evidence)

Cardiac rehabilitation decreases anginal pain and improves heart failure symptoms, such as shortness of breath and fatigue.

Improved blood fat levels: (NHMHRC Level II evidence)

Cardiac rehabilitation including exercise training and education results in improved lipid and lipoprotein levels.

Smoking cessation: (NHMHRC Level II evidence)

Cardiac rehabilitation with well-designed educational and behavioural components reduces cigarette smoking. Sixteen to 26 percent of patients, who previously smoked, can be expected to stop smoking.

Improved sense of well-being: (NHMHRC Level II evidence)

Education, counselling and psychological interventions in addition to exercise training improve a patient's sense of well being.

Reduction in mortality: (NHMHRC Level I evidence)

Comprehensive cardiac rehabilitation has been shown to reduce death rates in patients who have had a myocardial infarction by 25 percent.

Service provision

The remainder of the ACRA Guidelines refers to “service” to describe the CR site, which may provide a range of options for providing CR. “Program” is used to refer to an individual’s own plan of action.

Cardiac rehabilitation and secondary prevention services are offered at different levels according to the phase of recovery for the individual. Health professionals in Australia generally recognise three phases of recovery for cardiac rehabilitation:

1. Inpatient – the period of hospitalisation from admission to separation;
2. Outpatient – from hospital separation until the person’s medical, physical and psychological condition has stabilised or the person is discharged from the service;
3. Maintenance – following completion of the outpatient phase; ongoing.

Within each phase, cardiac rehabilitation services should address recovery issues, psychological impact and adjustment, education and information needs and behaviour change. Where possible services should be focused on the needs of people with cardiac disease with each client assessed as an individual.

Phase 2 services can be offered in a variety of settings included hospital outpatient setting, community-based setting and home-based setting. In addition, while the majority of referrals may originate from a hospital setting community referrals are encouraged.

Section 2 of these guidelines details the planning, development, improvement and evaluation of cardiac rehabilitation and secondary prevention services, and highlights the benefit of a multi-professional team, where available. Sections 3, 4 and 5 provide specific guidelines for the provision of services at an inpatient, outpatient or maintenance level, respectively. Section 6 outlines important considerations that providers and health practitioners may need to address with regard to characteristics of the population affected by cardiovascular disease that may impact on service provision and effectiveness. These include age, gender, socioeconomic status, aboriginality and ethnicity, geographic location and co-morbidity.

Eligibility for Cardiac Rehabilitation and Secondary Prevention Services

The guidelines provided in this book focus on people with CHD and heart failure following recent hospitalisation. A large proportion of this information will be relevant and appropriate for people with other cardiovascular diseases and for people who have not recently been hospitalised. Cardiac rehabilitation services are appropriate for people with:

- ❖ Acute coronary syndrome: myocardial infarction, unstable angina
- ❖ Chronic ischaemic heart disease
- ❖ Heart failure and cardiomyopathy
- ❖ Arrhythmia

This will include people who have undergone a range of procedures as part of their treatment such as coronary angioplasty or stenting, coronary artery bypass surgery, valve surgery, cardiac transplantation, implantation of a defibrillator or pacemaker.

Rehabilitation has many facets and people will benefit from different aspects or components of services offered. Any person with cardiovascular disease having difficulty with adjusting to their condition either physically or psychologically is likely to benefit from a service to some degree and should be encouraged to participate. People newly diagnosed with cardiovascular disease may be initially unable to determine whether or not they will benefit from a service offered. Therefore access to services needs to be flexible and should allow people to observe sessions or components prior to committing themselves to attend.

ACRA's Goal

This document provides practical guidelines for health practitioners working with people who have cardiovascular disease, and aims to promote further development and improvement in the quality and availability of cardiac rehabilitation and secondary prevention services throughout Australia and elsewhere.

The Executive Management Committee of ACRA encourages health practitioners and service providers to use this guide in conjunction with other resources and in collaboration with their local community to continue to develop innovative services that meet the needs of people with cardiovascular disease and their families.

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