



Exercise based rehabilitation: Coronary heart disease

Intervention

Supervised or unsupervised aerobic exercise (eg walking, stationary cycle) alone or as part of a complex cardiac rehabilitation (CR) program that includes psychosocial or educational interventions.

Indication

While CHD is the single most common cause of death worldwide, more patients are surviving and need support to manage symptoms and reduce future problems.

People with coronary heart disease (CHD), with the aim of improving health and outcomes. More specifically, to enhance recovery, reduce cardiovascular mortality, decrease risk of hospitalisation and improve health-related quality of life (HRQoL) after an acute cardiovascular event. This may be after an event such as myocardial infarction (MI), coronary artery bypass graft (CABG), or percutaneous coronary intervention (PCI), or for people with angina pectoris or coronary artery disease.

Contraindications

Exercise programs (particularly unsupervised) may not be suitable for patients with:

- unstable angina
- symptoms such as chest discomfort or shortness of breath on low activity
- uncontrolled cardiac failure
- severe aortic stenosis
- uncontrolled hypertension (eg systolic BP ≥ 180 mmHg and diastolic BP ≥ 110 mmHg)
- acute infection or fever
- resting tachycardia/arrhythmia
- uncontrolled diabetes (eg blood glucose < 6 mmol/L or > 15 mmol/L).

Precautions

Exercise training is safe and effective for most patients with CVD, with the guiding principle being to start slow and progress gradually.

Patients who are very deconditioned will have to start with 5 minutes of slow walking or 20 watts on a bicycle ergometer. Duration should be built up to 20 minutes, as allowed by symptoms. This may take some weeks to achieve. Once the patient can comfortably complete 20 minutes, the intensity can start to increase.

After an acute MI it is recommended that patients undertake a supervised cardiac rehabilitation program, and/or not increase intensity until 4 weeks after the event.

Caution is also necessary for patients with comorbid orthopaedic or neurological problems.



Adverse Effects

The National Heart Foundation reports that the risk of any major cardiovascular complication (MI, cardiac arrest or death) is one event in 117,000 hours of supervised exercise.

Availability

Australian Cardiovascular Health and Rehabilitation Association (ACRA) provides state and territory program directories

www.acra.net.au

www.acra.net.au/cr-services/cr-directory

The Heart Foundation and ACRA affiliates have also developed 'maps' of the Cardiac Rehabilitation and Heart Failure Services Directory and made this information available on the [Heart Foundation website](#) by going to *Find your nearest cardiac rehabilitation service*.

heartfoundation.org.au/your-heart/living-with-heart-disease/cardiac-rehabilitation

Typically, cardiologists prescribe CR programs. However, some GPs are comfortable prescribing CR interventions and monitoring patient progress. The Heart Foundation has created a [Physical activity in patients with cardiovascular disease: management algorithm and information for general practice](#)

heartfoundation.org.au/images/uploads/publications/physical-activity-in-patients-with-cvd-management-algorithm.pdf

Both centre-based and home-based forms of cardiac rehabilitation seem to be equally effective. Smart-phone programs have also shown to be effective.



Description

An exercise based CR program involves:

- assessing the patient's baseline ability, limitations and cardiovascular risk
- developing an exercise prescription (see below)
- observing the patient's response to that prescription and adjusting the prescription as necessary
- encouraging long-term participation in regular unsupervised exercise.

An appropriate exercise prescription, in parallel with a medication prescription, includes type of activity (mode) and location (centre-based or home-based), duration (how long for each session and for the program) and frequency (usually on a weekly basis), intensity (dose) and, very importantly, progression.

Mode

Low-impact aerobic exercises such as walking, cycling, rowing and machine stair climbing (that use large muscle groups) are all effective. The mode(s) of exercise chosen should be enjoyable for the individual and simple to carry out to maximise compliance. People with joint problems generally tolerate cycling better than walking.

Frequency and duration

The recommended frequency of exercise is at least three times a week (this can be a combination of supervised and unsupervised sessions), but preferably on most days of the week. This is necessary to achieve a significant improvement in functional capacity. Each session includes three phases: warm up (5–10 minutes), training phase (20–45 minutes of continuous or discontinuous aerobic activity) and cool down (5–10 minutes).

Programs vary in their duration, but 6–8 weeks is common in Australia.

Intensity

Exercise intensity can be specified as a heart rate, a speed and grade of a treadmill/stationary cycle, or using the [rating of perceived exertion](#) (RPE or Borg scale), which most patients can learn and apply easily during unsupervised exercise.

www.heartonline.org.au/media/DRL/Rating_of_perceived_exertion_-_Borg_scale.pdf

The exercise intensity for healthy adults is usually a 12 to 13 (somewhat hard) on the RPE scale. This corresponds to 60–70% of functional capacity. Individuals with a low baseline fitness level, which is often the case with cardiac patients, should begin at a lower percentage of capacity (eg equivalent to a rating of exertion of 11 on the Borg scale).

The incremental benefit of very high intensity exercise (>90% capacity) is small and is not recommended because it leads to lactate accumulation and fatigue, and increases the risk of physical injury and cardiovascular complications.

Progression

The exercise prescription is progressed according to patient tolerance, motivation and goals, symptoms, baseline fitness level and musculoskeletal limitations.



Tips and Challenges

CR is an essential part of contemporary heart disease care and is considered a priority in countries with a high prevalence of CHD. CR programs may involve some or all of:

- baseline patient assessment
- exercise training and physical activity counselling
- coronary risk factor reduction / secondary prevention, including nutritional counselling, weight management, smoking cessation
- psychosocial support
- education regarding medication adherence.

Exercise has been shown to be the most effective component of the intervention.

Early enrolment in a CR program improves subsequent attendance and outcomes. The first visit can be as early as the first week after hospitalisation for an uncomplicated MI or PCI. However, patients with complicated hospital courses or who received a CABG may have to wait longer before starting.

GPs may consider having a stationary exercise bike in the practice and supervise initial exercise sessions. A bike with a 'watts' reading is useful to set intensity targets. Where appropriate, patients may purchase or hire a stationary exercise bike and arrange a GP home visit.

For patients who cannot attend supervised training or afford to purchase equipment, activity can still generally be prescribed, such as walking 20–30 minutes daily at an intensity that feels moderate in effort. Periods of rest can be interspersed. Progression can occur by adding time to the initial 20–30 minutes or increasing the speed of walking. Options such as walking around a shopping centre may help patients who prefer a sheltered safe environment. Engaging family and carers can also help encourage adherence.

Grading

NHMRC Level I evidence.

Training

Australian Centre for Heart Health runs training courses for health professionals

www.australianhearthealth.org.au/training

Australian Cardiovascular Health and Rehabilitation Association (ACRA) core components of cardiovascular disease secondary prevention and cardiac rehabilitation 2014

www.acra.net.au/wp-content/uploads/2015/03/Woodruffe-et-al-2015-ACRA-core-components.pdf

Heart Foundation. Cardiac rehabilitation

heartfoundation.org.au/for-professionals/clinical-information/cardiac-rehabilitation-for-health-professionals



References

Anderson L, Thompson DR, Oldridge N, et al. [Exercise-based cardiac rehabilitation for coronary heart disease](#). Cochrane Database Syst Rev 2016(1):CD001800. doi: 10.1002/14651858.CD001800.pub3.
onlinelibrary.wiley.com/doi/10.1002/14651858.CD001800.pub3/abstract

Taylor RS, Dalal H, Jolly K, et al. [Home-based versus centre-based cardiac rehabilitation](#). Cochrane Database Syst Rev 2015(8):CD007130.
onlinelibrary.wiley.com/doi/10.1002/14651858.CD007130.pub3/full

Consumer resources

Heart Foundation – cardiac rehabilitation
www.heartfoundation.org.au/your-heart/living-with-heart-disease/cardiac-rehabilitation