

CHRONIC HEART FAILURE AND EXERCISE

WHAT IS CHRONIC HEART FAILURE?

Chronic heart failure (CHF) is a life-threatening condition that occurs when the heart no longer sufficiently pumps enough blood to the lungs and the rest of the body. Patients present with reduced ejection fraction ('impaired systolic pump', HFREF), preserved ejection fraction ('impaired diastolic filling', HFPEF), or a combination. People with CHF are often breathless and tire easily, especially during exercise. Worsening or poorly managed heart failure may cause fluid to build up in the lungs, known as acute pulmonary oedema or 'water on the lungs'. This is accompanied by severe breathlessness and anxiety, frothy sputum and coughing, and requires urgent medical attention. Fluid may also build up in other regions, causing peripheral oedema (e.g. puffy, swollen ankles) and venous congestion (e.g. prominent jugular veins). Exercise professionals must monitor and intervene if their clients experience fluid accumulation (see below). CHF has many causes and presentations, the most common being myocardial infarction (heart attack), hypertension (high blood pressure), ageing, diabetes, and alcohol and substance abuse.

HOW IS CHF MANAGED?

For people with CHF, a combination of medical and lifestyle management usually improves symptoms and quality of life, slows the progression of disease and prolongs life. Exercise is a key management strategy and Accredited Exercise Physiologists (AEP) and Physiotherapists are ideally placed to help patients to exercise safely and comfortably, as well as improve their clinical and functional status and quality of life (see below). Controlling cardiovascular risk factors is very important to prevent and manage CHF. This includes lowering levels of blood cholesterol and other fats, lowering blood sugar levels and controlling blood pressure (BP), limiting alcohol intake, stopping smoking, and engaging in regular physical activity.

Patients with CHF are mostly prescribed multiple drug classes including ACE inhibitors or angiotensin receptor blockers to control BP, diuretics to reduce fluid loads and beta blockers to lower heart rate and prevent arrhythmias. Together, this standard triple therapy acts to reduce the work of the heart, slows the progression of disease, improves exercise tolerance, symptoms and quality of life, and reduces mortality. For acute exacerbations of CHF, inotropes such as digoxin may be given to temporarily boost the action of the heart. Atrial fibrillation is common in CHF and is managed using any of ablation, pharmacotherapy (for arrhythmias and to prevent clotting) and/or pacemakers. A goal of pacing is also to achieve cardiac resynchronisation. Some patients with severe CHF undergo surgery to reduce the size of a swollen heart or to fit an extra pump to assist the ventricular pump. Patients need to adhere to advice regarding salt and fluid intakes and follow a healthy, low fat, low sugar diet with plenty of fresh fruit and vegetables. In addition, a properly planned exercise program is very beneficial to improve signs, symptoms and quality of life, and reduce mortality.

HOW DOES EXERCISE HELP WITH CHF?

Exercise has many benefits for people with CHF:

- increases cardiovascular function (VO₂peak) that is highly linked to improved clinical outcomes;
- increases muscle strength and endurance;
- improves ability to function and undertake activities of daily living to maintain independence;
- improves quality of life and reduces anxiety and symptoms of depression;
- reduces the occurrence and severity of the signs and symptoms associated with CHF; and
- slows the rate at which the disease progresses, which reduces both the number of times patients are hospitalised and the death rate from CHF.

Exercise acts as a 'poly-pill' to improve physical fitness, clinical status and mental health.



IMPORTANT CONSIDERATIONS FOR CHF AND EXERCISE

CHF is a serious condition and a number of factors must be considered when designing an exercise program:

- People with CHF must be medically stable before starting an exercise program. Patients should adhere to their management plans, including prescribed medications and fluid and salt intake. Daily weighing (after evacuating bowels and bladder) is important to detect early signs of fluid accumulation: exercise must be avoided if there is weight gain of 3kg in the preceding 72 hours and patients should be advised to consult their primary care medical practitioner.
- The approach to exercise is similar for HFREF and HFPEF patients, although the finer aspects of their clinical presentations will be different. The severity of disease affects both exercise tolerance and exercise prescription.
- Generally, people with CHF have more energy for exercise in the morning, especially mid-morning.
- The exercise program should be enjoyable to be sustained long term and include some usual daily activities such as walking to shops and walking the dog.
- Before starting a program, properly supervised exercise tests are advisable to determine safe and effective modes, volumes and intensities of exercise. Tests include any or all of the following: aerobic fitness (VO₂peak), heart rate and rhythm, oxygen saturation, blood pressure, muscle strength and endurance tests and functional capacity assessments. A multi-stage exercise test (e.g. treadmill protocol) is superior to a single stage test (e.g. 6-minute walk test) for monitoring, recording and reporting exercise-induced adverse signs or symptoms, and prescribing exercise.
- Most patients are compromised in their heart rate responses to exercise (e.g. medications, chronotropic incompetence, pacemakers) and so it is inadvisable and even dangerous to prescribe exercise using heart rates as an input. Ratings of perceived exertion is a safer alternative.
- The exercise program should include both aerobic (endurance) training and resistance exercise training (weight training), and exercise at high intensities invokes more risk and discomfort (e.g. post-exercise hypotension and fatigue that may last for days) for little return.
- Low BP is a common problem for people with CHF, during and especially after exercise. BP and other vital signs and symptoms should be monitored before and after each supervised exercise session and clients can also self-monitor BP. Low BP can cause symptoms of light-headedness, fainting, sweating, anxiety, distress, and disturbances in heart rhythm. Clients should be taught to recognise adverse signs and symptoms associated with exercise and report these promptly to their primary healthcare professional.
- People with CHF and diabetes should monitor and self-manage their blood sugar levels before and after exercise.

IS EXERCISE SAFE FOR PEOPLE WITH CHF?

There is a wide choice of safe exercise options for people with CHF. Exercise should be tailored to a person's medical status, management plans, exercise capacity, and lifestyle goals. As a guide, aerobic exercise should be performed on most days of the week for between 20 and 60 minutes, at an intensity that suits the person's condition. Exercise can be taken in one session or broken up into smaller periods of exercise and physical activity throughout the day. Resistance training should be performed on 2–3 days a week, with 8–10 different exercises for the major muscle groups. Two or three sets of 8–12 repetitions, with weights that require a moderate to high effort (e.g. 50–80% of one repetition maximum), are appropriate. An alternative to a formal exercise program is to actively engage in activities of daily living that incorporate exercises for strength and endurance, mobilisation, flexibility, and balance. Good examples are active travel, gardening, light housework, walking to the shops, and carrying or wheeling the shopping home.

RESOURCES & FURTHER INFORMATION

Exercise is Medicine Australia www.exerciseismedicine.org.au
Exercise Right www.exerciseright.com.au
Find a Physiotherapist www.choose.physio
Find an Accredited Exercise Physiologist www.essa.org.au
National Heart Foundation www.heartfoundation.org.au
Find a Sport and Exercise Physician www.acsep.org.au/

If you have any concerns about the safety of your patient in commencing an exercise program, please consider referral to a Sport and Exercise Physician.

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REFERENCES

1. ACSM's Resource Manual for Guidelines for Exercise Testing and Exercise Prescription (2018) 10th edition, American College of Sports Medicine, Baltimore: Lippincott, Williams & Wilkins.
2. ACSM's Exercise management for persons with chronic diseases and disabilities (2016) 4th edition. American College of Sports Medicine, Champaign, IL: Human Kinetics.
3. Adsett J, Mullins R (2010). Evidence Based Guidelines for Exercise and Chronic Heart Failure. www.health.qld.gov.au/heart_failure/pdf/guide_exercise_chf.pdf
4. Pina IL, Apstein CS, Balady GJ, et al. (2003). Exercise and heart failure: a statement from the American Heart Association Committee on exercise, rehabilitation, and prevention. *Circulation* 2003; 107(8): 1210–25.
5. Sagar VA, Davies EJ, Briscoe S, et al. Exercise-based rehabilitation for heart failure: systematic review and meta-analysis. *Open Heart*. 2015;2(1):e000163.
6. Selig S, Levinger I, Williams A, et al. Exercise and Sports Science Australia position statement on exercise training and chronic heart failure. *J Sci Med Sport* 2010; 13(3): 288–94.
7. Smart N, Haluska B, Jeffriess L, Marwick TH. Exercise training in systolic and diastolic dysfunction: effects on cardiac function, functional capacity, and quality of life. *Am Heart J*. 2007;153(4):530–6.[2]

