

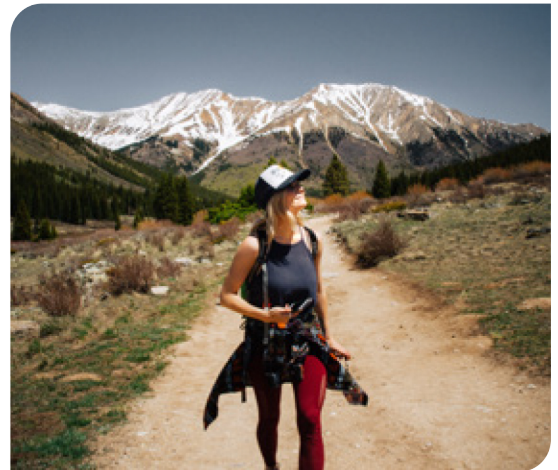
CONGENITAL HEART DISEASE AND EXERCISE

WHAT IS CONGENITAL HEART DISEASE?

Congenital heart disease (CHD) is a term used to describe abnormal heart structure that has resulted from a problem with the development of the heart in utero and is present from birth. CHD can result in relatively minor heart problems or very major defects that can result in entirely absent heart valves or chambers.

HOW IS CONGENITAL HEART DISEASE TREATED?

The treatment for each type of CHD is different. Less significant problems may simply be monitored whereas more serious issues might require open heart surgery or long-term medications. It is important to recognise that CHD is rarely completely fixed and that most people require intermittent check-ups with a cardiologist, even though they might feel completely well and can live normal lives.



HOW DOES EXERCISE BENEFIT PEOPLE WITH CONGENITAL HEART DISEASE?

Exercise has many important benefits for people with CHD such as:

- Increasing cardiorespiratory fitness, muscle strength and endurance
- Improving mental health and quality of life
- Reducing symptoms of breathlessness and fatigue
- Helping to maintain a healthy weight, improve self-confidence and body image

Exercise also helps to reduce the risk of acquired cardiovascular problems like high blood pressure, stroke and heart attack.

WHAT ARE IMPORTANT CONSIDERATIONS FOR CONGENITAL HEART DISEASE AND EXERCISE?

Almost everyone with CHD can benefit from exercise but it is important to do it in a way that is safe and beneficial.

People with CHD may have almost normal heart structure and function or have complex abnormalities affecting the heart and its function. The presence or absence of these abnormalities and how they affect exercise prescription is outlined in Table 1. It is important that anyone with CHD talks with their cardiologist about what kind of exercise and levels of exertion are best suited for their situation. This is because some types of heart problems may be prone to developing unusual heart rhythms or blood pressure during high levels of physical exertion.

People with CHD should be clinically stable prior to starting an exercise program. If a person has been sick due to their condition, it might be necessary for their doctor to stabilise their health before they start an exercise program. Alternatively, their cardiologist may actually recommend exercise if they have recently deteriorated or had a procedure and refer them to an appropriately qualified exercise professional (Accredited Exercise Physiologist or Physiotherapist) to help build fitness again in a supervised environment. Occasionally, due to a severe or complex problem, the cardiologist might suggest the person only perform light levels of exercise.

Depending on the type of congenital heart condition, it may be necessary for a doctor to perform some tests before an exercise program is commenced to help determine how much exercise is right for a person. This also helps to monitor changes in fitness in the long term.



It is important that if patients notice a change in symptoms during exercise, such as chest discomfort/pain, palpitations, dizziness, or feeling generally unwell, they cease the exercise session, inform the person supervising the exercise (if it's a supervised session) and let their doctor know as soon as possible.

Fainting or becoming unconscious during exercise can be a sign of a serious problem and requires prompt cardiology review. Exercise should be discontinued until cardiology clearance is given.

Some patients with complex CHD will have reduced oxygen saturations and may desaturate markedly with exercise. In this group, high intensity exercises may be poorly tolerated. In general, continuous saturations monitoring during training is unnecessary and perceived level of exertion is the most useful guide for exercise intensity.

HOW MUCH EXERCISE SHOULD PEOPLE WITH CONGENITAL HEART DISEASE DO?

Exercise programs for people with CHD should include a combination of aerobic exercise, which helps to build heart and lung fitness, as well as resistance training exercises that help build muscle strength, bulk and endurance (Table 2.). The optimal intensity of exercises and length of training sessions will depend on the specific situation, but in general, aiming to build up to doing exercise on most days of the week for 20 to 60 minutes is a good goal. Starting slowly, even with just a few minutes, can help improve fitness. People should include activities that they enjoy as they're more likely to persist with an exercise program if this is the case. Increasing ad hoc activities during the day, such as taking the stairs or walking a little bit further than usual, will also help to improve the overall health of people with CHD.



Table 1. Risk classification of CHD patients based on cardiac abnormalities to guide exercise training intensities

Risk classification	Ventricular function	Aorta	Outflow tract obstruction	Pulmonary Hypertension	Valvular function	Arrhythmias	Recommended exercise intensity
Low risk	Normal or only mild dysfunction	No coarctation/dilation	Minimal or none	No	No/mild regurgitation or stenosis	No history arrhythmias	Moderate to high intensity AT and RT
Moderate risk	Moderate dysfunction	Mild coarctation/dilation	Mild	Mild	Moderate stenosis or regurgitation	History of mild arrhythmias	Low to moderate intensity AT and RT
High risk	Severe dysfunction	Moderate-Severe coarctation/dilation	Moderate-Severe	Moderate-severe	Severe stenosis or regurgitation	Malignant or significant arrhythmias	Low intensity AT and RT

AT – aerobic training, RT – resistance training; * If patients have factors in more than one classification the higher risk stratification is applied. Detailed exercise training recommendations based on Risk Classification level are provided in Table 2. Modified from Budts et al.

Table 2. Aerobic and resistance exercise prescription based on risk classification

Mode	Risk Classification	Intensity	Frequency	Duration (aerobic training)/No of sets (resistance training)
Aerobic Training	Low	50 - 80% HRR + resting HR or 70 - 90% HR max 12 - 16 RPE	3 - 5 days/ week	Commence at 5- 10 minutes and increase as tolerated to 30 - 60 minutes
	Moderate	40 - 70% HRR + resting HR or 65 - 80% HR max 12 - 14 RPE		or
	High	30 - 60% HRR + resting HR or 55 - 75% HR max 10 - 12 RPE		Interval training may be employed to increase tolerance to exercise. Commencing at a work: active rest ratio of 1:3 progressing to 1:1.
Resistance Training	Low	50 - 70% 1RM 1 - 3 sets, 8 - 10 repetitions ≥ 1 minute rest between sets	≥ 2 days/ week	Commence at 1 set progressing to 3 sets as tolerated. Initial supervision is recommended to provide instruction in correct lifting technique.
	Moderate	40 - 60% 1RM 1 - 3 sets, 10 - 12 repetitions ≥ 1 minute rest between sets		
	High	30 - 50% 1RM 1 - 3 sets, 12 - 15 repetitions ≥ 2 minutes rest between sets		

HRR, heart rate reserve; HR, heart rate; RPE, rate of perceived exertion; 1RM, one repetition maximum

RESOURCES & FURTHER INFORMATION

Exercise is Medicine Australia www.exerciseismedicine.org.au

Exercise Right www.exerciseright.com.au

Find an Accredited Exercise Physiologist www.essa.org.au

Find a Physiotherapist www.choose.physio

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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HeartKids www.heartkids.org.au

National Heart Foundation www.heartfoundation.org.au



RELATED INFORMATION AND REFERENCES

1. AMERICAN HEART ASSOCIATION. 2017. Congenital Heart Defects and Physical Activity [Online]. Available: http://www.heart.org/HEARTORG/Conditions/CongenitalHeartDefects/CareTreatmentforCongenitalHeartDefects/Congenital-Heart-Defects-and-Physical-Activity_UCM_307738_Article.jsp#.Wcru16Zrx1t [Accessed October 2017].
2. AUSTRALIAN GOVERNMENT. 2014. Australia's Physical Activity and Sedentary Behaviour Guidelines [Online]. Department of Health. Available: <http://www.health.gov.au/internet/main/publishing.nsf/Content/health-pubhlth-strateg-phys-act-guidelines> [Accessed October 2017].
3. LONGMUIR, P., BROTHERS, J., DE FERRANTI, S., HAYMAN, L., VAN HARE, G., MATHERNE, P., DAVIS, C., JOY, E. & MCCRINDLE, B. 2013. Promotion of Physical Activity for Children and Adults With Congenital Heart Disease: A Scientific Statement From the American Heart Association. *Circulation*, 127, 2147-2159.
4. NATIONAL HEART FOUNDATION OF AUSTRALIA. 2017a. Being active when you have a heart condition [Online]. Available: <https://www.heartfoundation.org.au/your-heart/living-with-heart-disease/being-active-when-you-have-a-heart-condition> [Accessed October 2017].
5. NATIONAL HEART FOUNDATION OF AUSTRALIA. 2017b. Get active [Online]. Available: www.heartfoundation.org.au/active-living/get-active [Accessed October 2017].
6. TAKKEN, T., GIARDINI, A., REYBROUCK, T., GEWILLIG, M., HÖVELS-GÜRICH, H., LONGMUIR, P., MCCRINDLE, B., PARIDON, S. & HAGER, A. 2012. Recommendations for physical activity, recreation sport, and exercise training in paediatric patients with congenital heart disease: a report from the Exercise, Basic & Translational Research Section of the European Association of Cardiovascular Prevention and Rehabilitation, the European Congenital Heart and Lung Exercise Group, and the Association for European Paediatric Cardiology. *European Journal of Preventive Cardiology*, 19, 1034-65.
7. UPTODATE. 2016. Physical activity and exercise in patients with congenital heart disease (CHD) [Online]. Available: <http://www.uptodate.com/contents/physical-activity-and-exercise-in-patients-with-congenital-heart-disease-chd> [Accessed October 2017].
8. Budts W, Börjesson M, Chessa M, et al. Physical activity in adolescents and adults with congenital heart defects: individualized exercise prescription[†]. *European Heart Journal*. 2013; 34(47):3669-3674.