

# DYSLIPIDAEMIA & EXERCISE

PROFESSIONAL

## WHAT IS DYSLIPIDAEMIA?

Dyslipidaemia refers to abnormal levels of blood fats (lipids) or lipoproteins. The most common dyslipidaemias are high blood cholesterol and triglyceride levels, high levels of low-density lipoprotein cholesterol and low levels of high-density lipoprotein cholesterol. A blood test (lipid profile) is used to diagnose the condition. Management of dyslipidaemia is important for people with, or at risk of, cardiovascular disease because a poor lipid profile is a significant risk factor for cardiovascular disease and mortality (1,2).

## HOW IS DYSLIPIDAEMIA TREATED?

Management of dyslipidaemia aims to reduce the risk of cardiovascular events (i.e. serious problems such as heart attacks) that may occur within the next 5-10 years (the absolute cardiovascular risk), by improving lipid profile. Any lowering of LDL-c and triglycerides, or raising of HDL-c, can be beneficial for reducing this risk (3). Recommended targets are (1, 2):

- less than 2.5 mmol/L for LDL-c in healthy people;
- less than 1.8 mmol/L for LDL-c in people with existing heart disease;
- greater than 1.0 mmol/L for HDL-c; and
- less than 2.0 mmol/L for triglycerides.

Management of cardiovascular risk should include lifestyle changes such as taking regular exercise, improving the diet and, ideally reducing weight, especially body fat. All people, especially those at high risk, should aim for these changes (1, 2). When lifestyle changes are insufficient, medications may be prescribed by a doctor to help achieve a better lipid profile (e.g. statin or ezetimibe therapy for cholesterol, fibrates or marine oil omega-3 sources for triglycerides). Marine oil omega-3 is best obtained from fish consumption. When larger amounts are required, evidence has favoured pharmacological formulations.

## WHY IS EXERCISE IMPORTANT FOR DYSLIPIDAEMIA?

The consensus evidence from studies using randomised controlled trials in adults with cardiovascular disease and overweight/obesity (4, 5, 6, 7) shows that regular exercise can:

- Decrease blood triglyceride levels (typical mean reduction ~ 0.1 to 0.3 mmol/L)
- Produce modest increases in HDL-c (typical mean increase ~ 0.1 mmol/L)

Regular exercise may lead to small reductions in cholesterol levels, although the evidence is unclear. The consensus evidence suggests that exercise interventions do not usually change LDL-c unless weight loss is achieved. Benefits on cholesterol, LDL-c and blood triglyceride levels are superior with dietary change or the combination of exercise and diet than exercise alone, especially when these lead to weight loss (8). As an adjunct to statin therapy exercise can offer other benefits for adults with dyslipidaemia but the combination of statin therapy and exercise does not appear to be any more beneficial to statin monotherapy for improving lipid profile (9).

Exercise training has other benefits which should be considered for the broader health management of people with dyslipidaemia including (9,10):

- Assisting with weight loss and weight management
- Improving cardiorespiratory fitness
- Reducing the risk of type 2 diabetes
- Improving cardiovascular risk and mortality risk.

## WHAT ARE THE IMPORTANT CONSIDERATIONS FOR DYSLIPIDAEMIA AND EXERCISE?

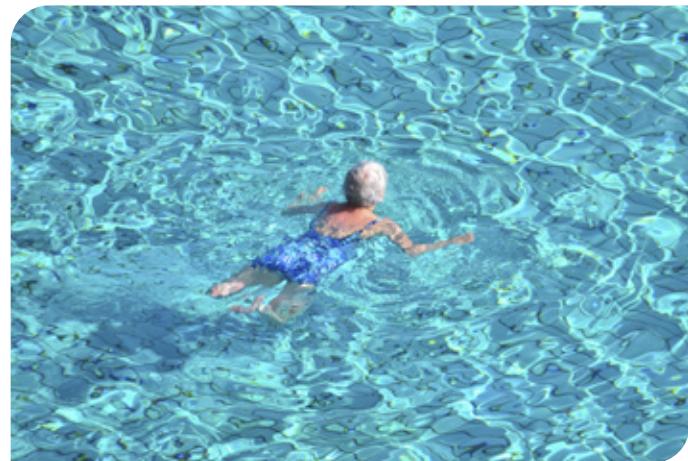
All individuals with dyslipidaemia should be screened by an appropriately qualified health professional (e.g. Accredited Exercise Physiologist or Physiotherapist) prior to initiating a new exercise program, or significantly altering or changing the approach to a current exercise program. As dyslipidaemia is a condition commonly associated with metabolic and other cardiovascular dysfunction, exercise should be prescribed as appropriate for other primary diagnoses (e.g. type 2 diabetes, chronic kidney disease, cardiovascular disease) with consideration of other co-morbidities

(e.g. hypertension, hyperglycaemia, and osteoarthritis). If an individual with dyslipidaemia is also being managed by another health professional such as a cardiologist or an endocrinologist, it is important to communicate the exercise management plan with them.

## WHAT TYPE OF EXERCISE IS BEST?

Individuals should target 150-300 minutes per week of moderate aerobic exercise (such as brisk walking, cycling, swimming, jogging, dancing and team sports). Smaller benefits can likely be achieved with lower doses of aerobic exercise, however it is recommended that patients exercise on at least three days per week. Exercise should be undertaken at a moderate intensity (55-69% HRmax or rating of perceived exertion 3-4/10). Vigorous intensity exercise (70-89% HRmax or rating of perceived exertion 5-6/10) involving 75-150 minutes per week, or a combination of moderate and vigorous aerobic exercise may be considered where appropriate, although there is less evidence regarding the efficacy of vigorous exercise on lipid profile.

While the evidence for direct benefit on lipids and lipoproteins is less compelling, progressive high intensity resistance training appears to benefit individuals with dyslipidaemia. Two to three resistance training sessions each week can be undertaken, involving 2-4 sets of exercises at a moderate to vigorous effort equivalent to ~ 70-85% of 1 repetition maximum (1-RM), each for 8-12 repetitions. Examples of exercises that have been demonstrated to be effective and can be tailored to the individual are: squats, calf raises, lunges, leg press, chest press, seated row, shoulder press, biceps curl and triceps extension.



## RESOURCES & FURTHER INFORMATION

Exercise is Medicine Australia [www.exerciseismedicine.org.au](http://www.exerciseismedicine.org.au)

Exercise Right [www.exerciseright.com.au](http://www.exerciseright.com.au)

Find a Physiotherapist [www.choose.physio](http://www.choose.physio)

Find an Accredited Exercise Physiologist [www.essa.org.au](http://www.essa.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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National Heart Foundation  
[www.heartfoundation.org.au](http://www.heartfoundation.org.au)



## REFERENCES

1. Tonkin A, Barter P, Best J, et al. National Heart Foundation of Australia and the Cardiac Society of Australia and New Zealand: position statement on lipid management – 2005. *Heart Lung Circ* 2005; 14(4): 275-91.
2. National Heart Foundation of Australia and the Cardiac Society of Australia and New Zealand. Reducing risk in heart disease: an expert guide to clinical practice for secondary prevention of coronary heart disease. Melbourne: National Heart Foundation of Australia, 2012.
3. Mihaylova B, Emberson J, Blackwell L et al. The effects of lowering LDL cholesterol with statin therapy in people at low risk of vascular disease: meta-analysis of individual data from 27 randomised trials. *Lancet* 2012; 380(9841): 581-90.
4. Kelley GA, Kelley KS, Franklin B. Aerobic exercise and lipids and lipoproteins in patients with cardiovascular disease: a meta-analysis of randomized controlled trials. *J Cardiopulm Rehabil* 2006; 26(3): 131-9.
5. Kelley GA, Kelley KS, Tran ZV. Aerobic exercise, lipids and lipoproteins in overweight and obese adults: a meta-analysis of randomized controlled trials. *Int J Obes* 2005;29(8): 881-93.
6. Kodama S, Tanaka S, Saito K et al. Effect of aerobic exercise training on serum levels of high-density lipoprotein cholesterol: a meta-analysis. *Arch Intern Med* 2007; 167: 999-1008.
7. Kelley GA & Kelley KS. Impact of progressive resistance training on lipids and lipoproteins in adults: a meta-analysis of randomized controlled trials. *Preventative Medicine* 2009; 48(1): 9-19.
8. Kelley GA & Kelley KS. Comparison of aerobic exercise, diet or both on lipids and lipoproteins in adults: a meta-analysis of randomized controlled trials. *Clin Nutr* 2012; 31(2): 156-167.
9. Gui Y, Liao C, Liu Q et al. Efficacy and safety of statins and exercise combination therapy compared to statin monotherapy in patients with dyslipidaemia: a systematic review and meta-analysis. *Preventative Cardiology* 2017; 24(9): 907-916.
10. Sesso HD, Paffenbarger RS, Lee IM. Physical activity and coronary heart disease in men: The Harvard Alumni Health Study. *Circulation* 2000; 102(9): 975-80.