

Type 2 Diabetes and exercise

What is type 2 diabetes mellitus?

Type 2 diabetes (T2DM) is a chronic condition characterised by varying levels of insulin resistance causing hyperglycaemia (raised blood glucose levels). Further, for those at increased risk of developing T2DM, Impaired Glucose Tolerance (IGT) and Impaired Fasting Glucose (IFG) are used to characterise conditions where insulin resistance and hyperglycaemia are not as severe as those with T2DM. It was estimated that in 2002 that 7.4% of Australians had T2DM (half of whom are unaware) (3) increasing to approximately 10.7% in the US in 2007(1). Recent Australian data shows the number of people with T2DM rises by a further 0.7-0.8% each year (6). In total, T2DM is estimated to cost over \$3 billion per year.

How is T2DM monitored?

Diabetes management should be monitored regularly by your general practitioner using fasting blood glucose levels and HbA_{1c} (which gives an indication of long term glucose management). Regular medical reviews will include monitoring of other health risk factors and complications associated with T2DM. People with T2DM should self monitor their blood glucose one or more times a day with a blood glucose meter. Measuring blood glucose levels is particularly important before, during and after exercise. Patients who manage and are involved in their own monitoring report more stable glucose levels and improved health outcomes.

How does exercise help?

Increasing physical activity can reduce the incidence of T2DM by almost 60% in people at risk (5). Studies show that exercise can help prevent or delay T2DM, improve management of blood glucose, decrease the proportion of body fat, decrease the risk of heart disease, and increase heart and lung fitness in people with T2DM (7). Non-optimal blood glucose levels leads to earlier onset of associated diseases and complications such as heart, kidney and eye diseases, and an increased risk of death. Improved blood glucose management often means people can reduce their T2DM medications. As people with diabetes age, the benefit of maintaining muscle mass through exercise is also likely to improve physical function and independence (8).

What exercise is best for people T2DM?

The table below shows the type, intensity, duration and frequency of exercise recommended for people with T2DM. The total amount of exercise should include a combination of aerobic and resistance training. Aerobic exercise (e.g. walking or running) increases heart and lung fitness, while resistance training (e.g. lifting weights) can maintain and increase muscle and bone strength. Importantly, combining both aerobic and resistance training has recently shown to be more beneficial on blood glucose levels in people with T2DM (2).

Type of exercise	Intensity	Duration	Frequency
Aerobic exercise (for heart and lung fitness)	Moderate Vigorous	Total of 210 min per week Total of 125 min per week	On at least 3 days a week with no more than two consecutive days without exercising
Resistance training (for muscle and bone strength)	Moderate to vigorous	60 minutes per week (included in totals above)	2 or more times per week (2-4 sets of 8-10 repetitions)



Who should exercise?

The benefits of increased physical activity far outweigh the risks for people with T2DM. If people are unable to meet the guidelines there are still health benefits from working towards achieving these levels.

The following points should be kept in mind before starting an exercise program:

- **Low blood glucose:** Hypoglycaemia occurs relatively rarely in people with T2DM and is likely to be associated with medications. If necessary, consult with your health professional before commencing exercise to discuss your medications and monitoring of your blood glucose levels. Exercise may need to be temporarily modified if T2DM is unstable.
- **Risk of cardiac events** (e.g. heart attacks): The risk of remaining inactive usually outweighs this risk. However, people wishing to exercise vigorously, older people, and people with established cardiovascular disease should be screened by their GP prior to commencement of their program.
- **Peripheral neuropathy:** This condition is associated with T2DM and alters sensation in the hands and feet. Appropriate footwear, regular foot inspection and low-impact exercises are essential with peripheral neuropathy, and are also highly advised for all people with T2DM.
- **Hypertension** (high blood pressure): Although exercise reduces hypertension in people with T2DM, those with unstable blood pressure should avoid vigorous exercise, particularly resistance training of vigorous intensity.
- **Obesity:** For overweight people with T2DM, weight loss will reduce joint pain and discomfort when exercising, and encourage them to continue exercising.

References and further information

Exercise is Medicine Australia www.exerciseismedicine.org.au

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

Exercise Right www.exerciseright.com.au

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