

# Physical activity & type 1 diabetes

Physical activity is any activity that gets your body moving, makes your breathing become quicker, and your heart beat faster. There are many different types of physical activity to choose from.

Regular physical activity can offer benefits to your diabetes and your overall health.

## What is physical activity?

Physical activity includes planned exercise and day to day activity. There are different ways to be physically active every day, including:

- > strength training, tai-chi, walking groups, hydrotherapy classes and yoga
- > sexual intercourse
- > golf, lawn bowls, bocce, and various types of dancing
- > housework, walking to the local shop instead of driving, gardening and raking leaves, and vacuuming
- > activity that is supervised by a coach, team manager, fitness leader, physiotherapist or exercise physiologist.

Physical activity does not have to be organised or competitive to be helpful. Whether on your own, or with family and friends, it can be fun.

## What are the benefits?

For people with type 1 diabetes, physical activity helps to:

- > improve the body's response to insulin which can lower blood glucose levels
- > lower blood pressure and cholesterol levels, reducing the risk of heart attack and stroke
- > control weight (eg reduce waist circumference and body mass index)
- > reduce the risk of diabetes complications.

Other benefits include:

- > stronger bones
- > improved mood
- > increased energy levels
- > increased strength, power and balance
- > reduced stress and tension
- > improved sleep.



## How much is enough?

Doing any physical activity is better than doing none. If you are inactive, start by doing something, and slowly build up to match (or better) the national recommendations.

The Australian Physical Activity Guidelines for Adults aged 18 - 64 years suggest that you:

- > be active on all or most, days every week.
- > do up to 150 - 300 minutes (2½ - 5 hours) of moderate intensity physical activity or 75 - 150 minutes (1¼ - 2½ hours) of vigorous intensity physical activity, or a combination of both moderate and vigorous activities, each week.
- > use muscle strengthening activities on at least 2 days each week.

Moderate intensity physical activity is when you notice your breathing and heart rate speeding up and you develop a light sweat. Vigorous intensity physical activity is activity that requires more effort and makes you breathe harder and faster or “huff and puff” (eg jogging, aerobics classes or strenuous gardening). Strength training activities include body weight exercises (eg wall push-ups or sitting and standing from a chair, machine based exercises or free weight exercises).

## Are there any risks?

Overall, the benefits of physical activity outweigh the risks. Diabetes can put you at risk of certain conditions that could be affected by physical activity.

If you are new to physical activity, have other health problems, or are concerned about the safety of being (more) active, speak with your doctor or health professional about the best activities for you.

Before starting any new activity, your doctor will consider your blood glucose levels, any diabetes complications and the condition of your heart and blood vessels.

Your doctor may advise you to have a stress test as a precaution if you:

- > are over 35
- > have high blood pressure
- > have or have had heart problems.

As most physical activity involves using your feet, seeing a podiatrist or credentialed diabetes educator before you start your program for a foot risk assessment and advice on suitable footwear is needed.

## How can I manage my diabetes during physical activity?

Each person's response to physical activity is different. It is important to work out your way of balancing your physical activity with your diet and insulin. Your doctor, credentialed diabetes educator or dietitian will be able to assist you.

### Carbohydrate (CHO) needs

The intensity and duration of your activity will affect the amount of energy you need. The type of activity, and its timing with main meals/snacks and dose of rapid-acting insulin is likely to affect the type and amount of carbohydrate (CHO).

As a guide:

- > **ensure energy stores before exercise** such as eating a meal containing CHO, fats and protein 3 - 4 hours before physical activity will enable energy stores to be available

- > **extra CHO** may also be needed if physical activity is unplanned, of high intensity, lasts a long time and if the insulin dose cannot be reduced. Extra CHO should be matched as far with the predicted CHO need (eg during the time of peak insulin action, the typical amount of CHO needed is 1.0 - 1.5g of CHO per kg of body weight per hour).

It is also important to stay well hydrated. Drink enough water to avoid thirst and remember you will need a bit more than usual while being active. Your dietitian or credentialed diabetes educator will be able to assist you with any questions and concerns.

### Insulin therapy

The intensity and duration of your physical activity will affect your insulin needs. If you are increasing your activity level to reduce your weight, your insulin dose/s may need to be reduced before, during or after. This avoids the risk of low blood glucose levels (hypoglycaemia).

Basal-bolus insulin allows you flexibility in insulin adjustment for physical activity and can assist weight loss. As a guide, the changes to insulin doses are based on the time of day and duration of activity:

Physical activity time of day and duration	Basal-bolus insulin dose considerations
Physical activity done early in the morning, before breakfast:	<ul style="list-style-type: none"> <li>&gt; reduce previous evening basal (intermediate or long-acting) insulin dose by 20 - 50%</li> <li>&gt; reduce pre-breakfast bolus (rapid-acting) insulin dose after physical activity by 30 - 50%</li> <li>&gt; reduce evening dose of basal insulin on the day of the physical activity.</li> </ul>
Physical activity done after a meal:	<ul style="list-style-type: none"> <li>&gt; try to delay exercise until at least 1 - 2 hours after the meal</li> <li>&gt; reduce pre-meal bolus insulin dose by 30 - 50% if physical activity lasts up to 4 hours; for all day activity, reduce all meal bolus doses across the day by 30 - 50%</li> <li>&gt; reduce previous evening basal insulin by 50%, and the basal insulin dose by 10 - 20% up to 24 hours after all-day activity (eg bush walking, cycling).</li> </ul>
Intermittent high intensity physical activity (eg team sports)	<ul style="list-style-type: none"> <li>&gt; reduce pre-meals bolus insulin by 70 - 90% if physical activity starts within 1 - 3 hours of the meal.</li> </ul>

Flexibility is also offered by insulin pumps and insulin adjustment considerations are:

- > reduce the basal rate for 1 - 2 hours before planned physical activity
- > reduce the basal rate by 30 - 50% for the duration of the activity
- > suspend insulin delivery for up to 2 hours
- > reduce overnight basal rate by 20 - 30% or sometimes more, after vigorous and prolonged activity.

Your doctor or credentialed diabetes educator can discuss your insulin therapy any changes required.

## Blood glucose levels

HbA1c levels above 7.5% can make it hard to be physically active and cause you to feel tired. Blood glucose levels in your target range will assist you with any form of physical activity.

Being aware of your HbA1C target range and result, and testing your blood glucose levels before, during and after physical activity will check how your blood glucose levels are affected. It will also confirm that your planning has worked or will identify that further changes are needed. Your doctor or credentialled diabetes educator can assist you.

## Is there any precautions?

**Hypoglycaemia – low blood glucose** can occur during, when you stop and in the hours after physical activity. The responses to low blood glucose levels such as sweating and palpitations may be confused with your body's response to being active. Always carry your blood glucose meter and hypo treatment. Your doctor or credentialled diabetes educator can discuss risk, provide advice for prevention (eg CHO requirements, changes to insulin dose/doses), a hypo action plan and hypo kit.

**Hyperglycaemia – high blood glucose** can result if you have not been able to match your insulin dose and CHO foods with very intensive or long duration activity.

If mild high blood glucose, and no ketones, it is not necessary to stop. Your doctor or credentialled diabetes educator can discuss risk and provide advice (eg CHO needs, changes to insulin dose/doses), a high blood glucose/sick day action plan and insulin adjustment (eg correctional insulin) action plan.

**Retinopathy** – if you have retinopathy you may need to avoid strenuous activity until your eye specialist says that your condition is stable.

**Neuropathy** – if you have lost sensation in your feet you should talk to your doctor, your podiatrist or credentialled diabetes educator about what activity is safest for you to do.

## Is there any reason to stop being active?

Stop your activity and rest if you get chest, abdominal, neck or arm pain or tightness, breathlessness, feel lightheaded or have any other unusual symptoms. These symptoms could mean heart trouble that requires urgent treatment at the nearest hospital emergency department.

If you get any other pain, stop until the pain goes away then re-start your activity. Make sure your doctor or diabetes specialist knows about what has happened. Over time you should be able to extend your activities.

If you are getting symptoms of a 'hypo', check blood glucose levels and treat as per your hypo action plan. Do not continue until your symptoms have gone and your blood glucose level has returned to normal.

If your blood glucose level is above 15mmol/L (not directly after eating), and you have ketones, then exercise should be postponed. The high blood glucose and low insulin levels can cause diabetic ketoacidosis.

## Any other considerations?

- > Wear your medical identification (eg Medic Alert).
- > Wear sunscreen, protect your head and layer your clothing so you can add or remove clothes as needed.
- > Check your feet after exercise or at least once a day looking for signs of redness, blisters, cracks and calluses. If your feet perspire, change into dry socks.
- > Each time you reach your goal, reward yourself then set a new goal to stay motivated.
- > Illness – do not be physically active if you are unwell.

## Important points to remember

- > Think of physical activity as an opportunity, not an inconvenience.
- > Be active every day in as many ways as you can.
- > Put together at least 30 minutes of moderately intensive physical activity on most, if not all, days.
- > Wear suitable foot wear, consult your podiatrist, doctor or credentialled diabetes educator.
- > As you are at risk of low blood glucose (hypoglycaemia), be prepared and have a hypo action plan.
- > If you have a blood glucose level above 15mmol/L (not directly after eating), and you have ketones, do not exercise and use your high blood glucose/sick day action plan.
- > Discuss the need for adjusting your CHO foods and/or insulin with your doctor, dietitian or credentialled diabetes educator.

Keeping a log of your physical activity can help you assess what you do, what you don't do and what you may be able to do more of. You can use this information to make healthier choices, monitor your progress and celebrate your successes. You can also discuss your personal goals your doctor or diabetes educator.

Date	Type of activity	Minutes	How I felt

### Personal Goals

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## Where can I go for more information?

Diabetes Australia

[www.diabetesaustralia.com.au](http://www.diabetesaustralia.com.au)

National Diabetes Services Scheme

[www.ndss.com.au](http://www.ndss.com.au)

Dietitian Association of Australia

[www.daa.asn.au](http://www.daa.asn.au)

Australasian Podiatry Council

[www.apodc.com.au](http://www.apodc.com.au)

Physical Activity Australia

[www.physicalactivityaustralia.org.au](http://www.physicalactivityaustralia.org.au)

## For more information

**CHSA Diabetes Service**  
**Country Health SA LHN**  
PO Box 287, Rundle Mall  
ADELAIDE SA 5000  
Telephone: (08) 8226 7168  
[www.chsa-diabetes.org.au](http://www.chsa-diabetes.org.au)

