

Managing physical activity and type 1 diabetes

Benefits of physical activity

Type 1 diabetes should not prevent you from being physically active. Physical activity can have a number of benefits including:

- Improving mood levels.
- Improving how well your body uses insulin.
- Improving overall health and well being.

The effects of physical activity on your blood glucose levels (BGLs) depend on many factors including:

- Current BGL trends and insulin regime.
- Your fitness level.
- The type, intensity and duration of physical activity.

Impacts physical activity may have on BGLs

- Hypoglycaemia (low BGLs):
 - This may occur as glucose is burned up for energy.
 - Your muscle cells are more sensitive to insulin.
 - Extra glucose is moved from the blood stream to replenish stores in the muscles and the liver during and after physical activity.
- Hyperglycaemia (high BGLs):
 - This may occur due to hormones (adrenalin) being released with high intensity activity or competition.
 - Too much glucose in the body before exercise.
 - Dehydration.
 - Too much carbohydrate being consumed before, during or after exercise.

How to reduce the risk of hypoglycaemia and hyperglycaemia during and after physical activity

- Check BGLs before, during and up to 6–8 hours after physical activity.
- Look for patterns and trends in your glucose levels.
- Aim for BGLs between 7–10mmol/L before physical activity.
- Carry carbohydrates (e.g. glucose gel, sports drinks).
- Avoid or limit alcohol before and after physical activity.
- Assess any need to adjust insulin doses before or after physical activity.
- Make sure you have prepared an individual plan for managing your diabetes with your Diabetes Educator and Dietitian.

Insulin adjustment and physical activity

When possible, plan exercise after the peak of your insulin action (e.g. delay exercise for 1–2 hours after your rapid acting insulin injection).

The following rapid acting insulin reductions are relevant if exercising within 90 minutes of your meal insulin bolus.

Exercise intensity	Rapid insulin reduction for 30 minutes exercise	Rapid insulin reduction for 60 minutes exercise
Low intensity (e.g. walking)	25%	50%
Moderate intensity (e.g. swimming, brisk walking, heavy housework)	50%	75%
High-intensity (e.g. running)	75%	-
Very high intensity (e.g. uphill cycling)	-	-
Anaerobic (e.g. weight training)	-	-

Figure one: Exercise and bolus insulin adjustment. Adapted from Riddell. MC et al. (2017), Exercise management in type 1 diabetes; a consensus statement

Carbohydrate intake and physical activity

Extra carbohydrate may be required before and/or during exercise depending on the type of exercise, your BGL trends and active insulin on board. This table highlights the recommended carbohydrate intake immediately before and during exercise.

Consuming 20–30 grams protein with carbohydrate within 2 hours of an exercise bout is recommended to help prevent hypoglycaemia and optimal muscle growth and recovery.

For example: 1 cup of milk based smoothie.

For further information, please discuss this with an Accredited Practising Dietitian or diabetes team.

Type of aerobic exercise	Before exercise (g CHO)				During exercise (g CHO)		
	BGL under 5mmol/ L	5–6.9 mmol/L	7–10 mmol/L	10.1–15 mmol/L	0–30 mins duration	30–60 mins duration	60+ mins duration (per hour)
Low intensity (e.g. walking, housework)	10–20g (without active insulin i.e. outside 90–120 mins of a bolus) or 15–30g (with active insulin i.e. outside 90–120 mins of a bolus)	10g (aerobic only)	-	-	-	-	15–30g
Moderate intensity (e.g. jogging, cycling, tennis)		10g (aerobic only)	-	-	15g	15–30g	30–45g*
High intensity (e.g. running, football)		-	-	-	15–30g	30–45g	45–60g
Other considerations	Delay exercise until BGL greater than 5mmol/L	Anaerobic and high intensity exercise can be started but BGLs could rise			Consider rapid absorbing CHO (e.g. glucose containing sports gels and drinks such as Gatorade)		

Figure two: Exercise and carbohydrate requirements with different time, type and intensity of exercise* 30–60g CHO per hour may be required under higher insulin conditions. Adapted from Riddell. MC et al. (2017), Exercise management in type 1 diabetes; a consensus statement