

Diabetes and Exercise

Adjusting your Insulin when Exercising



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Regular exercise is important in managing diabetes along with proper meal planning, taking your medication as prescribed, and managing your stress level. For your safety, speak to your healthcare team before starting any exercise program.

Here are a few things you need to consider before exercising.

- What type of exercise will I be doing?
- What is my blood sugar before exercise?
- When was my last rapid-acting insulin (Humalog®, Novorapid®, Apidra®, Fiasp®) injection?
- How much rapid-acting insulin did I take in the previous meal?
- How long and how intense will I be exercising?

There are different types of exercise: aerobic and resistance.

Aerobic exercise: Any activity that increases your heart rate and breathing. You can sustain the activity for an extended period of time (walking, jogging, biking, dancing, and swimming).

Resistance exercise: This type of exercise is performed at an intensity that causes you to get out of breath quickly. It can be sustained for only a few moments (sprinting, high-intensity interval training, weight training).

Weekly recommendations

- 150 minutes of moderate intensity aerobic exercise
- 3 sessions of resistance exercise

Before exercise

Step 1: Adjust your insulin

When physical activity is planned within 2 hours after a meal, adjusting your rapid-acting insulin of the meal before the exercise might be necessary to prevent a low blood sugar. The following chart can guide you in adjusting your insulin.

Intensity	30 minutes of physical activity	60 minutes of physical activity
Mild	Take 25 % less insulin.	Take 50 % less insulin.
Moderate	Take 50 % less insulin.	Take 75 % less insulin.
Heavy	Take 75 % less insulin.	Talk to your healthcare professional.

Step 2: Check your blood sugar level

It is important to monitor your blood sugar level before exercise to prevent complications during and after exercise. If you have had a severe low blood sugar (less than 2.8 mmol/l) in the last 24h, avoid exercise.

Blood sugar targets before exercise

- Resistance exercise: aim for a blood sugar level of 5 mmol/l
- Aerobic exercise: aim for a blood sugar level between 7 and 10 mmol/l

Starting blood sugar below 5mmol/l

Take 15 g of fast-acting sugar before starting exercise.

Exemples :

- 3/4 cup of juice or regular soft drink
- 4 Dex4® tablets
- 6 Life Savers® candies
- 3 tsp or 1 tbsp of sugar diluted in water

Delay exercise until blood sugar is above 5 mmol/l and monitor closely for low blood sugars (less than 4 mmol/l).

Starting blood sugar between 5 and 6.9 mmol/l

- Aerobic: take 10–15 g of fast-acting sugar before starting.
- Resistance exercise can be started.

Starting blood sugar between 7 and 10 mmol/L

- Aerobic exercise can be started.
- Resistance exercise and high-intensity interval training sessions can be started, but the blood sugar level could rise.

Starting blood sugar between 10.1 to 15.0 mmol/l

- Aerobic exercise can be started.
- Resistance exercise can be started. The blood sugar level may rise with this type of exercise.

Starting blood sugar above 15 mmol/l

For people with type 1 diabetes, if the elevated blood sugar is unexplained (not associated with a recent meal), check blood or urine ketones. Avoid high-intensity exercise.

If blood ketones are:

- **low** (<0.6 mmol/L), mild to moderate aerobic exercise can be started.
- **Modestly elevated** (up to 1.4 mmol/L), exercise should be restricted to a light intensity for only a brief duration (<30 min) and a small corrective insulin dose might be needed before starting exercise.
- **Elevated** (\geq 1.5 mmol/L), exercise is not recommended and blood sugar management should be initiated rapidly as per the advice of the healthcare professional team.

Step 3 : If necessary, have a snack

If no insulin adjustments have been made before your exercise, you might need to take extra carbohydrates without injecting rapid-acting insulin. The amount of carbohydrate will depend on your exercise.

Speak to your Diabetes Healthcare Team to help you decide if you need to have a snack before you exercise.

During exercise

Step 1: Check your blood sugar level

If your blood sugar falls below 5 mmol/l or if you have symptoms of a low blood sugar:

- Stop exercising and take 15 g of fast-acting sugar.
- Wait 15 minutes.
- Repeat blood sugar test. If your blood sugar level is still below 5 mmol/l, repeat the treatment.
- Once blood sugar is above 5 mmol/l, restart exercise.

Check your blood sugar level every 30 minutes to track patterns.

Step 2: Stay hydrated

Drink 1 cup of water for every 20 to 30 minutes of exercise.

After exercise

Step 1: Check your blood sugar level

Insulin sensitivity remains elevated for up to 24h after exercising. This can put you at risk of having a low blood sugar (less than 4 mmol/L). The lowest blood sugar level typically occurs around 3 in the morning during sleep, so setting an alarm to check your blood sugars might be a good idea.

If your blood sugar level is lower than 7 mmol/l before bed, have a 15 g carbohydrate snack combined with protein.

Examples:

- 1 cup of milk
- $\frac{3}{4}$ cup of yogurt
- 5 Triscuit® crackers + cheese
- 1 slice of bread + peanut butter

Step 2: Adjust your insulin as needed

If your exercise is in the morning or afternoon, you may need to adjust your rapid-acting insulin throughout the day.

If you exercise in the evening or you have had a low blood sugar more than once at night, you may need to decrease your evening basal insulin by 10%.

Targets in this guide are general and might need to be individualized. Speak to your Diabetes Healthcare Team to help build your exercise plan.

Your healthcare team is available to answer your questions. Do not hesitate to discuss details about your health, or your return home.

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