

Are you getting enough nutrients to exercise?

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Apart from proper meal planning, stress management and consuming medications as prescribed, regular exercise is the key part of managing diabetes.

Exercise increases insulin sensitivity, i.e., body tissues are more sensitive to insulin and use it to take up glucose more efficiently. This helps to monitor your blood glucose and improve your HbA1c.

Exercise is also important for overall well-being by strengthening the heart and improving blood circulation, strengthening the muscles and bones, lowering the risk of heart disease and stroke and helping us to lose or maintain weight, among others.

Effects of exercise on the blood glucose vary depending on:

- **blood glucose level before starting exercising**
- **the intensity of the exercise**
- **the length of time of the exercise**
- **changes made to insulin doses**

Exercise can lower your blood glucose up to 24 hours or more after the workout. Check the blood glucose level frequently before and after exercise. Plan ahead and know your typical blood glucose response to exercise to prevent too low or too high blood glucose.

FOODS YOUR BODY NEEDS

CARBOHYDRATE

Carbohydrate is the main energy source and the main fuel for working muscles. Carbohydrate is broken down into glucose during digestion and is used for energy. The remaining glucose is either stored as glycogen in the muscle and liver or is converted to fat if excess calories are consumed. Examples of carbohydrate include rice, noodles, bread, oats, plain biscuits, chappati and starchy vegetables such as potato, lentils, etc.

Small frequent meals with evenly distributed carbohydrate throughout the day help to control your blood glucose

Individuals with diabetes should be prepared to treat hypoglycaemia (low blood glucose) during or after exercise. If you are using insulin injection, it is important to balance your insulin doses with the food intake and exercise level.

level and provide adequate fuel for the body. Excessive intake of carbohydrate can lead to high blood glucose. Most people do not need to add extra carbohydrates to their meal plan unless they are exercising for more than an hour each time.

Consult your dietitian to work out your meal plan and the amount of carbohydrates you need per day.

PROTEIN

Protein is essential for muscle growth and repair. An adult needs to consume two to three servings of meat and alternatives daily (half a serving from dairy or other high-calcium products) according to the Singapore's Healthy Diet Pyramid Guidelines.

Examples of one serving meat and alternatives include:

- one palm-sized (90g cooked) of lean meat/ fish or poultry
- two glasses low fat milk
- two small blocks of soft bean curd
- two slices of cheese
- ¾ cup (120g) of cooked pulses (peas, beans, lentils)

Individuals who exercise regularly for fitness do not need extra protein except for growing individuals, body builders and professional athletes. Consuming extra protein itself does not build more muscles. Regular training is required to build muscle strength and size.



FLUIDS

Water is the best rehydration fluid and works well for exercises less than an hour each time. Drink plenty of water before, during and after exercise.

Monitor your urine colour. Clear or light coloured urine indicates adequate hydration while dark urine indicates dehydration.

Drink adequate water to keep your body well hydrated.

During exercise

No snack is required for less than an hour of exercise. If exercising for more than an hour, you may need an additional carbohydrate snack during the activity to prevent low blood glucose. Examples of snacks:

- half a banana
- a handful of raisins

Continue to drink enough water to keep your body well hydrated.

After exercise

If exercising for more than an hour, you will need a post-workout snack such as one small tub (about 100 to 150g) of low fat yoghurt and one small apple.

Drink enough water to have clear urine within two hours after completing the exercise.

Individuals with diabetes should be prepared to treat hypoglycaemia (low blood glucose) during or after exercise. If you are using insulin injection, it is important to balance your insulin doses with the food intake and exercise level.

When you experience hypoglycaemia during or after exercise ...

Treat it immediately. Use the same process as you would any other time of the day:

1. Consume 15g glucose or simple carbohydrate:
 - three teaspoons sugar or honey
 - half a glass (125ml) of fruit juice
 - half a can of soft drink (not diet)
 - glucose tablets (follow package instructions)

2. Recheck blood glucose level after 15 minutes.

3. If still low glucose level, repeat step 1 and 2.

4. Once blood glucose returns to normal, eat a snack if your next planned meal is more than half an hour away.

If hypoglycaemia occurs regularly when you exercise, seek advice from your healthcare provider about adjusting your treatment plan.

When you experience high blood glucose ...

This may happen during or after exercise especially when doing high-intensity exercise that increases the stress hormone levels.

If the blood glucose is high before exercise, check the blood or urine for ketones. Avoid vigorous activity if tested positive for ketones. It is fine to exercise if tested negative for ketones and you feel well.

Discuss with your dietitian regarding your exercise regime and meal plan if in any doubt.

Nutrition plan before, during and after exercise...

Before exercise

A carbohydrate snack with some protein.

- Examples:
- ½ cup oatmeal and ½ cup low-fat milk
 - one slice whole grain bread with one tablespoon of peanut butter

Drink adequate water to keep your body well hydrated.

During exercise

No snack is required for less than an hour exercise.

If exercising more than an hour, you may need additional carbohydrate snack during the activity to prevent low blood glucose.

- Examples of snacks:
- ½ piece banana
 - one handful of raisins

Continue to drink enough water to keep your body well hydrated.

After exercise

If exercising more than an hour, you will need a post-workout snack consisting of, e.g., one small tub (about 100 to 50g) of low fat yoghurt and one small apple.

Drink enough water to have clear urine within two hours after completing the exercise.