

EXERCISE AND TYPE 1 DIABETES

October 2002

If you are planning an exercise programme for the first time, or planning changes to your insulin that you have not tried before, talk to your specialist diabetes team first.

- Exercise is a balancing act between having enough insulin on board to allow for the extra energy needs of your muscles, and providing enough glucose (from food) to stop your blood glucose from going low.
- When you have Type 1 diabetes your body cannot (by itself) make the changes to insulin levels that are needed to keep your blood glucose level constant during exercise.
- Exercise makes your body cells more sensitive to the action of insulin.
- You may need to reduce your pre-exercise insulin, or take more food.
- Your body remains more sensitive to insulin for up to 24 hours after exercise. You may need to reduce your post-exercise insulin and/or eat more carbohydrate food following exercise.
- The key to managing exercise safely with Type 1 is to monitor your blood glucose frequently and use this information to adjust your food and exercise accordingly.
- Avoid injecting pre-exercise insulin into any area of working muscle (it may get absorbed much more quickly than usual if you do).
- There are risks to exercise. You should have a thorough medical check and consult with your diabetes specialist team before starting an exercise routine
- Keeping up an exercise schedule when you have Type 1 diabetes is an exciting challenge for your diabetes management skills.

TIPS FOR EXERCISING SAFELY IF YOU HAVE TYPE 1 DIABETES

- If you are starting an exercise or sporting programme and you are new to managing your diabetes during exercise, get help from your diabetes nurse educator or diabetes specialist before you start.
- If you have any complications of diabetes, including heart disease, retinopathy, neuropathy or kidney problems, see your diabetes team before planning an exercise routine.
- When you are starting out, start small and build up your fitness gradually. If you have been doing no exercise, start with 5-10 minutes of moderate exercise daily (e.g. brisk walking) and build this up by 5 minutes every 3-4 days until you are doing 30 minutes daily. Always exercise within your comfort zone. If you are out of breath it's best to slow down.
- Monitor your blood glucose levels frequently – before, during and after exercise. Keep a record of these along with how much you eat before and during exercise. Also record the intensity and duration of the exercise. Over time you will come to understand your body's usual response to exercise.

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- Fluids. It is especially important for people with diabetes to keep their fluid intake up during exercise. When your blood glucose levels are even a little higher than the normal range you are much more prone to dehydration. Dehydration can worsen high blood glucose levels.
- You are much more prone to having low blood glucose levels during or after exercise, so always carry some short-acting and long-acting carbohydrate with you. Carry some form of identification that says that you have diabetes and are on insulin. It is often best to exercise with another person. If you are exercising on your own let someone know where and when.
- Remember to take special care of your feet when exercising. Your choice of shoes for exercise is very important. If you are unsure as to what to buy consult a specialist shoe store or a podiatrist. Shoe stores are often quite happy to let you have shoes on approval so you can get your podiatrist to check them out.

MANAGING YOUR BLOOD GLUCOSE DURING EXERCISE

- It is often not a safe choice to exercise at a time of day when your short-acting insulin is peaking. This is because exercise makes you more sensitive to insulin. You are more likely to have a low blood glucose if you exercise when your short acting insulin is peaking.
- The best times to exercise are often:
 - First thing in the morning before you have taken your breakfast short-acting insulin (but after a small carbohydrate snack).
 - Or at the tail end of your breakfast short-acting insulin peak (before lunch but after a mid morning snack).
 - Or the tail end of your lunch time short-acting insulin peak (before evening meal but after a mid afternoon snack).
- **Pre-exercise blood glucose check?** Check your blood glucose before you exercise, preferably twice (30 minutes before and just before you begin) to check if your blood glucose level is stable. If it's dropping, you may need an extra carbohydrate snack before starting.
- **Pre-exercise snack?** Your pre-exercise blood glucose level will tell you if you need a snack before starting. The following chart provides a starting point only. You will need to test and record your blood glucose during & after exercise to see if these quantities are right for you.

Type of exercise	Pre-exercise blood glucose level of less than 6mmol	Pre-exercise blood glucose level of 6 - 10 mmol	Pre-exercise blood glucose level of 10 -15mmol
Short duration (20-30 mins) of low-moderate intensity e.g., walking	25g CHO	0g CHO	0g CHO
Short duration high intensity (e.g., running, squash)	25g CHO	0g CHO	0g CHO
Moderate duration (45 - 60 mins) moderate intensity e.g. cycling, swimming	25 - 50g CHO	0 - 25g CHO	0g CHO
Long duration (60-75 mins) moderate intensity e.g. triathlon, soccer, jogging	50g CHO	25 - 50g CHO	25g CHO
Note: CHO is shorthand for carbohydrate.			

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- **Blood glucose higher than 15mmol?** If your pre-exercise blood glucose is greater than 15mmol you should check your urine for ketones. If no ketones are present and your blood glucose has been falling it is safe to exercise moderately, so long as you check your blood glucose often and stop exercise if your blood glucose is climbing. If ketones are present it is best to rest, treat the blood glucose with short-acting insulin, drink plenty of low calorie fluids and delay exercise for the day.
- **Carbohydrate during exercise?** It pays to check your blood glucose about every 30 minutes when you are exercising. Most people seem to need about 50-60 grams of carbohydrate per hour during exercise. This is often easiest taken as fruit juice, dried fruit, sports drink or as a dextrose gel pack (available at many sports shops).

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