East Lancashire Hospitals NHS
NHS Trust

Exercise and Activity for Children with Type 1 Diabetes

East Lancashire Children and Young Peoples Diabetes Team

Safe | Personal | Effective

Exercise and Diabetes

Regular exercise is an important part of a healthy lifestyle for everyone, with or without diabetes. It is advised that children and young people are active for at least 60 minutes per day because this keeps you healthy.

The muscles that you are exercising need both glucose and insulin to work properly. It is important to get the balance just right.

Too much insulin and your blood glucose may fall too low during activity, you will have a hypo and you will not be able to perform to your best ability during your activity. Too little insulin and your muscles will not be able to use the glucose in your blood for energy, so you will not be able to perform to your best ability during your activity and your blood glucose levels will rise.

What is your Blood Glucose before the Activity?

The perfect blood glucose to start exercise is 7mmol, this means that there is enough (but not too much) glucose for the activity and enough (but not too much) insulin to get the glucose into your muscles.

Use your blood glucose level to determine what you need to do in order to help maintain your blood glucose reading on target throughout the activity, (see page 4 overleaf for table).

If your Blood Glucose drops during exercise use this

What is your blood glucose before exercise?	Do you need a 15g carbohydrate snack?	Are you safe to exercise?
Below 4mmol	Yes at beginning of activity.	You are not safe to exercise. Treat hypo, wait 10mins and re-test. You are safe to exercise once your blood glucose level is 4-7mmol.
4-7mmol	Yes if exercising for more than 30mins. And have another snack for each hour of activity that you do.	You are safe to exercise.
7-10mmol	Maybe if activity is longer than 30mins.	You are safe to exercise.
10-15mmol	No - as blood glucose is above target. Yes - if exercising for more than 30mins and blood glucose is dropping.	Exercise with caution. Re-test blood glucose after 30mins and if blood glucose is dropping, then continue with activity, if blood glucose is increasing you are not safe to exercise and may need more insulin.
Above 15mmol	No - as blood glucose above target.	CHECK FOR KETONES If you have ketones do not do any activity until your ketones have gone and your blood glucose level is 4-7mmol. You may need extra insulin.

Suitable 15g carbohydrate snacks

Small piece of fruit
125ml fruit juice mixed with 125ml water
250ml sports drink

Insulin and Exercise

If you exercise less than 2 hours after your insulin injection, it is more likely that your blood glucose will fall, as you have lots of insulin working. If your blood glucose is falling, use the exercise snacks to keep your blood glucose within 4-7mmol.

If you exercise 3-4 hours after your insulin injection, you may not have enough insulin around for your body to use the glucose for energy, so your blood glucose level may even go up, and you may feel that you aren't performing at your best.

If you exercise just after your insulin injection, try to avoid injecting into a place that you are just about to exercise as exercising the limb you have just injected into will increase the absorption of the insulin and increase the risk of your blood glucose dropping, e.g. avoid legs if going to be running or arms if boxing.

If you sometimes get a low blood glucose after activity, you may have to reduce your insulin dose at the meal before exercise.

After Exercise

Your blood glucose may drop after you stop exercising when your muscles are recovering from the activity you have done.

It is important to eat a low fat meal or snack containing carbohydrate food within 30 minutes of finishing your activity, e.g. pasta, bread, rice, potatoes, noodles, in order to replace the energy stores you have used up and prevent a hypo overnight. You may have to reduce your insulin dose with this meal if your blood glucose drops overnight, ask your diabetes team.

Aim for 1g carbohydrate for every 1kg of your body weight. If you are doing only light exercise then 50g of carbohydrates should be enough.

If your activity has lasted more than 1 hour, there can be a prolonged blood glucose lowering effect, meaning that you can have a lower blood glucose reading up to 12 hours after your activity.

This is because your body is replacing its stores of glucose, taking glucose out of your blood. Regular blood glucose monitoring is important, especially at 2am as this is when this is most likely to drop after activity.

Insulin After Exercise

If you have frequent hypos during the night or following day after activity, the amount of long acting insulin you give on the night of your activity could be decreased to prevent hypos the next day, or you could have a carbohydrate snack without insulin, ask your Diabetes team for advice on this.

The more exercise you do the more sensitive you can become to insulin, so you may see your insulin requirements falling.

Hypos and Exercise

Hypo's caused by exercise often need more fast acting glucose to treat them, than you would normally have, this is because your body has used up all its glucose stores during the activity.

More Advice

This information is basic advice about controlling your blood glucose during and after activity so if you would like any further information please ask your Diabetes Team.

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General Healthy Eating

Eat a varied and well balanced diet that supplies the right amount of energy and essential nutrients. The best way to provide the fuel you need for exercise is to have a low fat, high carbohydrate snack or light meal 2 - 3 hours before exercise.

Eating healthily will optimise your performance.

Fluid

Ensure you are well hydrated by drinking throughout the day as well as before, during and after exercise, as appropriate.

Being hydrated will optimise your performance.

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