

Exercise control

Each athlete's experience with type 1 diabetes will be different, so trial and error and keeping a detailed log are part of long-term diabetes control, writes

Sheila O'Kelly

Managing diabetes when pursuing excellence in sport requires dedication, long-term observation and patience, but then these are qualities that most high-achieving sports people already have.

There is no one system of managing diabetes that will work for every sports' person, but one of the key tools is meticulously logging your blood glucose levels in relation to your insulin, carbohydrates, exercise and time of day. This is the only way to find out what will work for you.

However, there are guidelines that can be useful to get started with optimising your diabetes management. And of course, before making any change to your diabetes regime you should consult your diabetes medical health care team.

Types of sport

Different sports have different effects on the body and there are key differences between managing endurance sports like cycling, and sport that produces short intense exercise, like sprinting.

"Diet is also very important for seri-

ous sports people with type 1 diabetes as they need a lot of calories and their insulin regime must reflect this," said Dr Ian Gallen.

Dr Gallen is the consultant diabetologist, at Wycombe Hospital, Buckinghamshire. Five-time Olympic gold medallist, Sir Steve Redgrave, who has type 1 diabetes, credits the treatment he received from Dr Gallen for enabling him to win his fifth Olympic gold medal for rowing in Sydney in 2000.

If you are a sports' person who develops type 1 diabetes, the first things you need to think about are:

- The type of sport you play
- What time of day you play
- How intensely you play
- For how long you play.

"Someone with diabetes, who is doing exercise like long-distance cycling, is burning glucose instead of fat," said Dr Gallen.

"The way we address this is by trying to get the circulating insulin levels down as low as possible during exercise; to try and make the physiology of the person as normal as possible."

Dr Gallen said this can be done by:

- Reducing background insulin levels
- Taking extra glucose – but you need to work out how much
- Stimulating the hormones that control the production of insulin.

Newly diagnosed athlete

If a high achieving athlete is newly diagnosed with type 1 diabetes, Sonya

Browne, Diabetes Clinical Nurse Specialist, in the Diabetes Centre in Beaumont Hospital, says that they should be able to get their diabetes in control and be back achieving in their sport within a couple of months.

Athletes tend to be quite focused anyway and they are usually determined to manage their diabetes so that they can continue their sport. It is important for athletes to keep testing and keep a log.

"It's down to testing, managing, keeping a log and working on your previous experience. We can't give a standard 'this is what you do'. You can't say if you've tried A, B will happen. You have to tailor the regime to fit the person," said Sonya.

Like Dr Gallen the Beaumont team find that it's matching the diabetes management to the particular sport that is key.

"It's those short bursts of activity that are really hard to manage like football, gym work and swimming," said Sonya.

"Someone might be swimming for half an hour and if they normally use a pump that they have removed, they've no long-acting insulin in reserve. Their fast-acting insulin is soon gone out of their system so that can be difficult," she said.

Sustained exercise

"Sustained exercise like hill walking is easier to manage because you can say okay 'I go hill walking every Sunday. I know if I reduce my insulin by 20% I'll be fine'," said Sonya.

Sonya Browne works with Helen Twamley who is Diabetes Clinical Nurse

SPORTING CHALLENGE

Manager, in the Diabetes Centre in Beaumont Hospital.

"It's not just about your blood sugar, it's about: what carbohydrate you are taking in, the duration of the exercise, your level of fitness and what time of the day you are exercising. There are so many variables," said Helen.

People who take part in sport have to be careful not to take too much insulin and have a hypo (episode of very low blood sugar), said Helen.

"But if they let their blood sugars go too high they will run out of puff. In addition, if the sugars are very high the person can start producing ketones, because there's not enough insulin there, and this can lead to ketoacidosis.

"Never, ever, exercise if you've got ketones present. Because it's a sign there's not enough insulin to sustain the exercise. If your blood sugar is over 12 and you are planning to exercise, check for ketones first. Don't think that you can just walk the high off," said Helen.

In relation to ketones building up after starting exercise, Dr Gallen says that as long as someone takes insulin towards the end of exercise or immediately after they finish, the ketones will not be a problem. This is because while you are exercising, ketones are burnt off, but as soon as you stop moving they start to build up.

Cycling and rugby

Dr Gallen said that this meant that for a sport that lasts for any length of time, such as cycling, a person using an insulin pump should start taking insulin from the pump about 30 minutes before they finish exercising. But this is not practical for people like rugby players, who should give themselves a shot of insulin as soon as they stop exercising. They should also rub their skin for quicker insulin absorption.

Hill walking

Helen Twamley said it was easier for people doing slow continuous aerobic exercise like hill walking to manage their diabetes. For example, someone going for a six-hour hike would probably need to

reduce their insulin in the morning, lunchtime, evening and bedtime.

"With exercise like hill walking, that lasts for a long time, you're using up a lot of energy. The liver is constantly releasing sugar into the blood to get into the muscles, and that all has to be put back. So you need to know what's going on in your body," said Helen.

Sprinting

Sprinting on the other hand is anaerobic exercise, which means that the sprinter will release lots of hormones like adrenalin and cortisone. This will increase the blood sugar quite dramatically, said Helen. With this type of sport the person may take a couple of units of quick-acting insulin before the event and the muscle claims back the energy used up.

Following exercise, there is a bigger risk of hypos:

- During the night
- Early the following morning
- During the following mid-morning
- The following evening.

"So it's all about knowing what's going on and starting slowly," said Helen. "I think the website runsweet.com can be very useful to some. It gives people the opportunity to chat about it."

Jogging

For someone regularly jogging, the most important thing is to keep a log, says Helen. This should include:

- The insulin you are taking
- The activity
- The duration of the activity
- What carbohydrate you ate before and after the run.

"You need to keep that continuously for a few sessions, revise it, try something new, and then go back and try that. It's really quite a hard slog to get it right," said Helen.

Soccer

Soccer is a sport with mixed activity like running, sprinting and kicking. Generally, the overall effect is that it will lower the blood sugar, said Helen Twamley. But for someone like a goalkeeper who is stand-

ing still or sprinting, they may often need to take insulin at half-time.

"But this will depend on which side is playing and which side is winning! They could be standing there with their arms folded," said Helen.

If someone is a forward or centre player and they are running up and down the pitch all the time the overall effect is that they would probably need to reduce their insulin, said Helen.

"They would need to check at half-time and maybe replace some glucose and see how it goes. Again, keep a log. On a match day a lot of soccer players would need to take a bit of insulin before they start because of the adrenalin," said Helen.

Competitions

The stress of a competition can set off a lot of hormones in the body like adrenalin and cortisone. This mobilises glucose into the blood stream and sends sugar levels very high.

"This can often happen at the beginning of a match when someone might see their blood sugar going up to 20, so they may need to take a couple of units of insulin, but again that depends on the person," said Helen.

"So, there's a lot of balancing. It's a really big challenge record everything on paper, but I think the big thing is starting slowly, testing it out and seeing what works for you," said Helen

Celebrating a win!

After a sporting competition people need to be very careful about the combination of exercise, alcohol and celebrations.

"Because you've a double whammy. Alcohol is going to lower the blood sugar during the night because it prevents the liver from releasing sugar; and the muscles will want to reclaim the sugar that they have used up during the sport that day.

"So you always really need to eat supper before bed and to check blood sugars again at 3.00am," said Helen.

In addition if you go out drinking after an event, you should stay with friends that night instead of going home on your own.