Athletics, Running and Diabetes

A guidance document for Leaders, Coaches and Volunteers

WHAT IS DIABETES?

Having diabetes means blood glucose (also known as blood sugar) levels are too high. Everyone needs some glucose for energy, and we get glucose when our bodies break down the carbohydrates that we eat or drink. The glucose is then released into our blood and transported to the parts of our body that need it for energy. In diabetes, people can't use the glucose properly so it builds up in their blood.

We need a hormone called insulin to move the glucose from our blood into our cells so it can be used for energy.

In Type 1 diabetes the body is unable to make any insulin at all. We don't know exactly what causes Type 1 diabetes, but it is not linked to lifestyle.

For more information about Type 1 diabetes visit:

www.diabetes.org.uk/diabetes-the-basics/what-is-type-1-diabetes

In Type 2 diabetes the body either can't make enough insulin or the insulin it does make doesn't work properly. There are several risk factors for Type 2 diabetes, including being overweight, ethnicity, age and family history.

For more information about Type 2 diabetes visit:

www.diabetes.org.uk/diabetes-the-basics/what-is-type-2-diabetes

HOW IS DIABETES TREATED?

Type 1 diabetes

The only treatment for Type 1 diabetes is to replace insulin via injections or an insulin pump. People with Type 1 diabetes will also to need to test their blood sugar level using a finger prick blood glucose meter, continuous blood glucose monitor or flash blood glucose monitor.

Sometimes people with Type 1 diabetes have blood sugar levels that are too high (hyper) or too low (hypo). This is because it isn't easy to exactly balance the insulin they give with the carbohydrate they eat and other factors that affect blood sugars like exercise, feeling unwell and stress. So testing blood sugars is an important part of managing the condition.

For more information about insulin and diabetes visit:
www.diabetes.org.uk/guide-to-diabetes/managing-your-diabetes/treating-your-diabetes/insulin

For more information about checking blood sugars visit:
www.diabetes.org.uk/guide-to-diabetes/managing-your-diabetes/testing

Type 2 diabetes

There are lots of different treatment options for Type 2 diabetes, so each person will have an individual management plan for their condition. Some people can manage their condition with lifestyle changes, but many also need medications that can include tablets, insulin or other injectable medications. Not everyone with Type 2 diabetes will need to test their blood sugars, this depends on the medication they use. People with Type 2 diabetes who use insulin or certain tablets (such as sulphonylureas), should be testing their blood sugars as they are at risk of low blood sugars (hypos).

For more information about medication visit:
www.diabetes.org.uk/guide-to-diabetes/managing-your-diabetes/treating-your-diabetes/tablets-and-medication

HYPOGLYCAEMIA (HYPOS)

Low blood sugars (hypos) are a side effect of insulin and some other medications that people with diabetes take. A hypo is when blood sugars are 4mmol/l or less. Certain things make hypos more likely, these include:

- missing or delaying a meal or snack
- not having enough carbohydrate at last meal
- doing a lot of exercise without having extra carbohydrate or without reducing insulin dose
- taking more insulin (or certain diabetes medication) than needed
- drinking alcohol on an empty stomach.

The symptoms of a hypo include: trembling and feeling shaky, sweating, being anxious or irritable, going pale, palpitations and a fast pulse, lips feeling tingly, blurred sight, being hungry, feeling tearful, tiredness, having a headache, lack of concentration. These are the common symptoms, but everyone is different and may describe their hypo symptoms in different ways.

It can be difficult to tell the difference between a hypo and just putting a lot of effort into exercise, so it is worthwhile being aware of the symptoms. A hypo must be treated immediately, otherwise it can become worse leading a person to be drowsy and confused. They can also become unconscious or have a fit. This is a severe hypo and they would need help to treat it.

- **A hypo is treated by eating or drinking 15-20g of fast acting carbohydrate, this might be glucose or dextrose tablets, sweets like jelly babies, a sugary drink, glucose gel. Which hypo treatment people choose is individual.**
- **If someone is having a severe hypo, you will need to take action as they might be unconscious (Severe hypos rarely occur in people with Type 2 diabetes). Don't give anything by mouth as they won't be able to swallow.**

Take action quickly:

- **put them into the recovery position** (on their side, with their head tilted back and knees bent)
- If you have been trained, give a glucagon injection (you don't have to be trained, but someone like a friend may have been trained)
- **Call an ambulance** – especially if you don't have a glucagon injection or they haven't recovered in 10 mins after the injection

If someone has had a severe hypo they should avoid all exercise for at least 24 hours after.

IMPORTANT NUMBERS

Someone with diabetes might tell you what their blood sugar levels are, so it's worthwhile having an idea of what the number means.

If it's less than 4mmol/l : Their level is too low (hypo) and they need some fast acting carbs (such as the hypo treatments listed above), they shouldn't do any exercise until it's above 5mmol/l and they will need to eat something (with starchy carbs) to stop them going low again.

4-7mmol/l: This is generally where people should aim to have their blood sugars before they have eaten any carbs. If they are going to do any exercise they will probably need to have a snack with starchy carbs beforehand to make sure their blood sugars don't go to low.

7-15mmol/l: slightly above target, safe to exercise but may need to think about the type of exercise they're doing. Less likely to need any carbs before exercise

>15mmol/l: blood sugars are above target and they will need to take action to help bring them down before doing any exercise as this could cause levels to get even higher. If the high blood sugars are unexplained, they should test their urine or blood for ketones.

ENGLAND ATHLETICS

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Everyone with diabetes is different and therefore two people may not use the same hypo treatment for low blood sugar levels.

Always encourage them to carry a supply of their preferred fast acting carb hypo treatment.

As a back-up first aid kits should contain some glucose or dextrose tablets and glucose gel.

MANAGING DIABETES WHEN EXERCISING

We know exercise can help to reduce someone's risk of developing Type 2 diabetes and can help to reduce the risk of long term complications of all types of diabetes and is therefore an important part of managing diabetes. Coaches/leaders and volunteers should not give advice on how to manage diabetes, they can provide a supportive environment for people with diabetes to exercise but the person with diabetes should be supported by healthcare professionals to effectively manage their condition.

Managing blood sugars in Type 1 diabetes

Exercise can affect blood sugar levels in different ways, depending on the type of exercise someone is doing.

Aerobic exercise like long distance running and cycling usually causes blood sugar levels to go down. This means people with Type 1 diabetes can be at risk of hypos when completing long duration activities.

Anaerobic exercise like sprinting, track cycling and weightlifting are more likely to cause blood sugars to go up and can mean people with Type 1 diabetes are at risk of their blood sugar levels becoming too high (hyper).

Hyperglycaemia

Anaerobic
Short duration
High intensity

Weightlifting	Swimming	Volleyball
Tag	Gymnastics	Ice hockey
Sprinting	Wrestling	Track cycling
Diving	Dodge ball	
Basketball	Skiing (Slalom & downhill	Rowing (middle distance)
Football	Field hockey	Running quicker (faster pace and interval training)
Tennis		
Lacrosse		
Skating		

Aerobic
Longer duration
Lower intensity

In-line skating	Jogging/Running (slow, longer distances)
Cross country skiing	Cycling
Brisk walking	

Hypoglycaemia

Several other things can affect what happens to blood sugar levels during exercise, such as how much carbohydrate was eaten before exercise, the pattern of blood sugar levels, hormones like adrenaline and how much insulin the person has taken. This means different activities will not always have the same effect on blood sugar levels.

There are different things a person with Type 1 diabetes can do to help manage their blood sugars around exercise. You will not need to advise them on this, they should discuss their individual plan with their diabetes healthcare team.

Things they might do include:

- Adjust the amount of insulin they give before and after exercise
- Consume additional carbohydrates (depending on their blood sugar levels), either before or during exercise
- Alternate different types of exercise

It is very important that someone with Type 1 diabetes tests their blood glucose level before exercise as this will help them to know what action to take.

Managing blood sugars in Type 2 diabetes

Many people with Type 2 diabetes will not need to test their blood sugar levels. If they take medication that can cause hypos (insulin or certain tablets) it is a good idea to test their blood sugars before exercise. They may also want to test during or after exercise and might need to have some carbohydrate or alter the type of exercise they do. This is not the case for everyone with Type 2 diabetes, and many people don't need extra carbs to manage their blood sugars during exercise.

In some cases they may also adjust the amount of insulin they give but this will be discussed with their diabetes healthcare team.

OTHER USEFUL INFORMATION

What are the symptoms of diabetes?

The symptoms of diabetes (high blood glucose levels) include:

- Going to the toilet a lot to pass urine
- Feeling really thirsty
- Unintentional weight loss
- Being very tired
- Blurred vision
- Recurrent genital itching or thrush
- Wounds and cuts taking longer to heal

Consistently high blood sugars can lead to a condition called diabetic ketoacidosis (DKA). This happens when there is a severe lack of insulin and the body can't use glucose for energy so it starts to breakdown other body tissue as an alternative energy. Ketones are the by-product and are poisonous chemicals which can build up and cause the body to become acidic. More information can be found here:

www.diabetes.org.uk/guide-to-diabetes/complications/diabetic_ketoacidosis

Complications of diabetes

In people with diabetes high blood sugar, blood pressure and cholesterol over a long period of time can cause damage to the blood vessels and nerves in the body and lead to diabetes complications. These complications include sight loss, heart disease, stroke, foot problems and kidney problems, among others. Some complications might affect the type of exercise a person can do, they will be advised by their diabetes health care team about this.

More information on complications can be found here:

www.diabetes.org.uk/guide-to-diabetes/complications

Further resources

www.diabetes.org.uk/guide-to-diabetes/enjoy-food/eating-with-diabetes/out-and-about/sports-nutrition-and-type-1-diabetes

www.diabetes.org.uk/Guide-to-diabetes/Enjoy-food/Eating-with-diabetes/Out-and-about/Sports-nutrition-and-Type-2-diabetes

www.runsweet.com/

CASE STUDY

Running with diabetes – Frank Rogers

I never liked running at school, I was big and slow and at the back so I didn't run. I started running in 2008, mainly to lose weight, and eventually I could run up to 5K, my P.B. was 43 minutes. I kept running and gradually I got this time down and was able to run 10K. After about a year running on my own I joined a running club and my running performance improved massively. I started to run longer distances, half marathons and then marathons. I ran Edinburgh, Snowdon, Barcelona and London marathons and it was great.

Then, in 2012 I was diagnosed with Type 1 diabetes, I was thirty nine years old and I was a bit gutted as I thought that meant that I wouldn't be able to run anymore, and I was pretty sure that it meant that I wouldn't be able to run marathons anymore.

Which was nonsense.

I've ran more marathons with Type 1 diabetes than I have without and I'm still running. When you first get diagnosed with diabetes it is a life altering event, which can be both overwhelming and isolating.

I'm lucky that I was already part of a running club as this provided a support structure for me in the early days after diagnosis. Most people don't understand what diabetes actually is so I went out of my way to explain to my coach and my running friends that I was now living with Type 1 diabetes, which meant that I was insulin dependent and there would be times when my blood sugars might go to low and I would have to eat straight away. I explained that this was basically what a hypo was, how to notice when I was having one and what to do when it happened. My coach and the whole of the club were massively supportive, which made it a lot easier for me to keep running.

Whether you are living with Type 1 or Type 2 diabetes, doing regular exercise is an important part of managing your condition. For me this is running. If you join a running group, or a running club, then you not only have people to run with which will help improve your running but you will have a support group to discuss your lifelong medical condition with. If there's not a group or club near you then you can go on social media and join in with a peer support group, and there are loads of them because more than 400 million people worldwide live with diabetes.

Yes, living with diabetes will make running more complicated, because it makes everything more complicated, but it should not be a barrier to your running.

For many people diabetes is currently a lifelong condition that you can't ignore without it causing complications, but you can improve your control over it. There are a raft of benefits you can get from running, one of the main ones for me is that it gives me better control over my diabetes which means that I'm able to get on with everything else in my life.

In 2013 I qualified as a Coach In Running Fitness with England Athletics and in 2018 I wrote my first book, Coach In A Book : Technically Efficient Running, but more importantly I'm still coaching and I'm still running.

Thanks to Diabetes UK for providing the content for this guidance document.
www.diabetes.org.uk