



Diabetes and competitive swimming

This fact sheet is full of information, tips and advice about how you can help an individual living with diabetes compete in swimming.

What is diabetes?

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

Insulin is a hormone that helps to move the sugar from our blood into our cells so it can be used for energy. There are several types of diabetes; the main types are Type 1 diabetes and Type 2 diabetes.

Type 1 diabetes:

- The pancreas is unable to make any insulin. We don't know what causes Type 1 diabetes, but we do know it's not linked to lifestyle.
- The only treatment for Type 1 diabetes is to replace insulin by injections or an insulin pump.
- People with Type 1 diabetes will need to test their blood sugar levels at home. This can be done by using a finger prick blood glucose meter, continuous or flash blood glucose monitor.
- Testing blood sugar levels is important as levels can sometimes be too high (hyper) or too low (hypo). It is difficult to exactly balance the insulin given with carbohydrate intake and exercise, illness or stress can also affect levels.

Type 2 diabetes:

- The pancreas either doesn't make enough insulin, or the insulin it does make can't work properly, known as insulin resistance.
- There are several risk factors for Type 2 diabetes, including being overweight, ethnicity, age and family history.
- There are different treatment options for Type 2 diabetes so each person will have an individual management plan.
- 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).

In both Type 1 and Type 2 diabetes a healthy diet and lifestyle helps to reduce the risk of long term complications associated with diabetes such as heart disease, nerve damage, sight loss and kidney disease.

What you need to know to support swimmers with diabetes in competitive swimming

Diabetes shouldn't stop anyone from swimming or achieving their goals. There are just a few things to consider.

Testing blood sugar levels

- For swimmers who test their blood sugar levels at home, testing during swimming can help them understand the effect it has.
- Longer distance swimming is more likely to cause low blood sugars, whereas short distance, sprint style races could raise blood sugar. During competition the swimmer will have the added effect of adrenaline and other stress hormones which could also raise blood sugar. It can be difficult to predict the effect exercise will have on blood sugar, especially if the swimmer is participating in mixed activities. Testing as often as possible can help them to manage their levels.

Insulin and swimming

- Insulin sensitivity can be increased for several hours (24-48 hours) after exercise, meaning people who treat their condition with insulin are at higher risk of low blood sugar levels during this time. Insulin sensitivity is how well the swimmer's body is using insulin to decrease their blood sugar levels. People with high sensitivity need less insulin than those with low sensitivity.
- The swimmer may need to adjust the dose of their basal (long acting) or bolus (short acting) insulin when they swim. For example the closer to their swim their last meal or snack was, the more likely it is that they will need to reduce their bolus (or meal time) insulin dose. This is very individual and the swimmer's diabetes healthcare team can advise them on an individual plan.

Diabetes kit

- For people who use an insulin pump, manufacturers will be able to advise on how water resistant the swimmer's particular model is. It is usually okay to disconnect the pump for up to an hour, but their diabetes healthcare team should give them individual advice.

- Manufacturers will also have information on whether kit like continuous glucose monitors or flash glucose monitors are water resistant. Each model is different so it is best to for the swimmer to check with the manufacturer of the monitor.

Diabetes complications

- If the swimmer has a complication of diabetes it's always best that they speak to their diabetes healthcare team before starting a new form of exercise.
- Everyone with diabetes should check their feet daily, continuing to do this after swimming can help to prevent any problems.
- If they have retinopathy, they should get advice about whether they are safe to dive. This doesn't mean they can't take part in swimming or other disciplines. Retinopathy is a type of eye disease that people with diabetes are more at risk of getting. It happens when blood vessels supplying the retina become damaged.

Hypo and hyperglycaemia

- The effect exercise has on the swimmer's blood sugar levels is individual to each swimmer but it can cause their levels to be lower or higher than normal depending on the type of exercise and how intense it was.
- The swimmer may not be able to spot the symptoms of hypoglycaemia (low blood sugar) when they are swimming or doing other types of exercise. This is because exerting themselves and having a hypo can feel similar.
- The swimmer's diabetes healthcare team should talk to them about the blood sugar levels to aim for before and after exercise to ensure they exercise safely.
- Common symptoms of hypos you can look out for 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. People may describe their symptoms differently.
- A hypo is treated by eating or drinking 15-20g of fast acting carbohydrate, this can include glucose or dextrose tablets, sweets like jelly babies, a sugary drink or glucose gel.
- 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 them anything by mouth as they won't be able to swallow.
 - Put the person into the recovery position (lying 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 a friend or family member may have been).
 - Call an ambulance, especially if you don't have a glucagon injection or they haven't recovered within 10 minutes after the injection.
 - If someone has had a severe hypo, they should avoid all forms of 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 numbers mean.

- **If less than 4mmol/l:** their level is too low (hypo) and they need some fast acting carbohydrate, they shouldn't do any exercise until above 5 mmol/l and they will need to eat something to stop levels decreasing again.
- **4-7 mmol/l:** this is generally where people should aim to have their blood sugar before they eat any carbohydrate. If they are going to do any exercise they will probably need to have something to eat beforehand to make sure their blood sugar doesn't go too low.
- **7-15 mmol/l:** slightly above target, safe to exercise but may need to think about the type of exercise they are doing. They will be less likely to need any carbohydrate before exercise.
- **>15 mmol/l:** blood sugar is above target and they will need to take action to help bring this down before doing any exercise as this could cause levels to get even higher. If the high blood sugar levels are unexplained, they should test their urine or blood for ketones.

Tips for supporting a competitive swimmer with diabetes

Do:

- ensure they inform Swim England and competition organisers that they have diabetes and the treatments they use
- encourage them to wear diabetes ID
- encourage them to work with their diabetes healthcare team to come up with an individual plan for managing their diabetes medications around swimming
- encourage them to regularly check blood sugar, particularly before and after swimming
- ask if they have hypo treatments with them if they use insulin or medications that can increase risk of hypos (like sulphonylureas) and ensure these are kept poolside
- remind them to check for any cuts or grazes after they swim that could have come from the side of the pool and encourage them to make sure they heal properly
- encourage them to wear flip flops or similar footwear around the pool to avoid injuries and reduce the chance of infections.

Avoid:

- swimming if they have had a severe hypo in the last 24 hours. They should discuss a plan with their diabetes healthcare team about what to do if blood sugar levels are high.

Remember:

- increased insulin sensitivity can last for several hours after exercise, so they will need to continue to test blood sugar after their swim and especially before bed.

What about medication in competition?

- Medication is an essential part of diabetes treatment, especially for people with Type 1 diabetes. Their diabetes healthcare team should work with the swimmer to find a management plan that takes account of their sport.
- Insulin is a medication that falls under the prohibited list according to WADA and UKAD. For swimmers who may be subject to doping control tests they can apply for a Therapeutic Use Exemption (TUE) to permit the use of insulin under the following criteria:
 - the athlete would experience significant health problems without taking the prohibited substance or method
 - the therapeutic use of the substance would not produce significant enhancement of performance, and
 - there is no reasonable therapeutic alternative to the use of the otherwise prohibited substance or method.
- The swimmer's diabetes healthcare team can help provide the information to support any application.

- Most other diabetes medications are permitted, but the swimmer should check the UK anti-doping rules and the Globaldro website.

Tips for coaches and clubs

- It is important to encourage athletes to have regular contact with diabetes healthcare team and ensure they attend all appointments.
- Encourage athletes to regularly test their blood sugar levels if appropriate to their treatment.
- Be aware of the symptoms of hypoglycaemia diabetes.org.uk/guide-to-diabetes/complications/hypos.
- Have additional hypo treatments readily available for athletes.
- Keep some carbohydrate containing snacks readily available.

Specific tips for competing in other disciplines with diabetes

Open water swimming:

- **Do:** think about the temperature of the water. Really cold water can make the swimmer more likely to have hypos and it might be harder to treat them if the swimmer is out in open water.
- **Do:** encourage swimmers to wear appropriate footwear at all times before getting in the water. This will protect their feet from temperature and sharp objects.

If swimming abroad:

- **Do:** ensure they take a copy of their prescription and extra medication and supplies than they would normally need, in case any get lost or stolen.
- **Do:** take a letter from their diabetes healthcare team may also be helpful.
- **Do:** ensure they test their blood sugar more often as changes in temperature can affect blood sugar levels.
- **Do:** ensure their insulin and diabetes kit are always stored at the appropriate temperature.

Additional advice

For more information about diabetes, please visit the following websites.

Runsweet Diabetes and sport:

runsweet.com/diabetes-and-sport/swimming/

Globaldro: globaldro.com/home/index

UKAD Protection Sport: ukad.org.uk/

British Swimming Anti-Doping: britishswimming.org/performance/swimming/anti-doping/tues/

Extod: Exercise for Type 1 Diabetes: extodorg.ipage.com/advice-for-patients.html

Sports nutrition and Type 1 Diabetes: diabetes.org.uk/guide-to-diabetes/enjoy-food/eating-with-diabetes/out-and-about/sports-nutrition-and-type-1-diabetes

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