



Diabetes and swimming

This fact sheet is full of information, tips and advice about how you can help an individual participate in swimming and other disciplines, if they are living with diabetes.

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 this 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 most common types are type 1 diabetes and type 2 diabetes. This fact sheet will also cover gestational diabetes.

Type 1 diabetes:

- An autoimmune condition which means the body's own immune system attacks and destroys the cells in the pancreas which make insulin. We don't know the exact cause of this immune attack, but researchers are working hard to find out.
- The 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 regularly. This can be done by using a finger prick blood glucose meter, continuous or flash glucose monitor.
- Sometimes blood sugar levels can be too high (hyper) or too low (hypo). This is because it's difficult to exactly balance the insulin they give with the carbohydrates they eat and other factors that can affect blood sugars such as exercise, feeling unwell and stress. That's why it's important to test blood sugar levels regularly.

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 living with overweight or obesity, 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.

Gestational diabetes:

- This type of diabetes affects pregnant women, usually in their second or third trimester.
- It happens because the hormones produced during pregnancy can make it difficult for their body to use insulin properly, increasing the risk of insulin resistance.
- Sometimes during pregnancy the body isn't able to make enough insulin to overcome this resistance.
- It can be treated with diet and lifestyle, tablets or insulin.
- Women with gestational diabetes may also test their blood sugar.

What you need to know to support swimmers with diabetes and swimming

Swimming, as with most forms of exercise, is great for people with diabetes. It can reduce the risk of cardiovascular disease, help manage blood sugar levels in type 2 and gestational diabetes, it increases insulin sensitivity and can contribute to weight loss or maintaining a healthy weight. Having diabetes shouldn't stop anyone from swimming, there are just a few things to consider.

Testing blood glucose levels

- Many people with diabetes will be asked to test their blood sugar levels at home, especially if they treat their condition with insulin or certain other medications (like sulphonylureas) that can cause hypos (low blood sugar levels).
- When exercising, swimmers should test their blood sugar levels more regularly, such as before, during and after swimming. This is so they can understand the affect that different types of exercise has on their levels.

Diabetes medications

- If the swimmer treats their diabetes with insulin or medications that can increase risk of hypos (like sulphonylureas), swimming can also cause blood sugar levels to be lower than normal. If this worries the swimmer it is best that they speak to their healthcare team.

- Additionally 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 hypos during this time. Insulin sensitivity is how well the swimmer's body is using insulin to get their blood sugar levels down. 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 the swim to their last meal or snack, 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. Different types of exercise, and other factors such as hormones, affect blood sugars in different ways and they may go up, or be higher than normal.

Diabetes kit

- For swimmers who use an insulin pump, manufacturers will be able to advise on how water resistant their particular model is. Their diabetes healthcare team can give individual advice as they may be able to disconnect for up to an hour at a time.
- 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 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 to 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 seek 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 specific to each individual, but it can cause their levels to be lower or higher than normal depending on the type of exercise and how intense it is.
- The swimmer may not be able to spot the symptoms of hypoglycaemia (low blood sugar) when they are swimming or participating in 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. Which hypo treatment people choose is individual.
- If someone is having a severe hypo, where they may be drowsy and confused or become unconscious or have a fit, you will need to take immediate action. (severe hypos rarely occur in people with type 2 diabetes).
 - Don't give 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 (some of these are different for women with gestational diabetes)

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 carbs, they shouldn't do any exercise until it's above 5mmol/l and they will need to eat something 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 something to eat beforehand, which contains carbs, to make sure their blood sugars don't go too low.
- **7-13mmol/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.
- **>If it's above 13mmol/l:** blood sugars are above target, and they will need to take action to help bring them down before doing 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. Check with the person with diabetes, or their caregivers, whether adjustments need to be made before the session and encourage regular testing to check the levels are lowering.

Tips for supporting swimmers with diabetes

Do:

- check that they have spoken to their diabetes healthcare team if swimming is a new type of exercise for them. If they treat their diabetes with insulin they should check with their diabetes healthcare team about the best way to manage their insulin around exercise
- encourage them to check their blood sugar levels regularly when swimming and especially before and after exercise
- ensure they carry hypo treatments if they use insulin or medications that can increase risk of hypos (like sulphonylureas), keep these poolside and inform the lifeguard that they have diabetes

- remind them to check for any cuts or grazes after they swim that they could have from the side of the pool and make sure they heal properly. They should seek help from their diabetes healthcare team if they have any concerns or they're not healing
- encourage them to wear flip flops or similar footwear around the pool to help avoid injuries and reduce the chance of things like verrucas
- encourage them to carry diabetes ID and make sure the person they're with or supervising them knows they have diabetes.

Don't:

- worry if they have type 2 diabetes and are not testing blood sugar levels at home, it might not be necessary for them. They should enjoy their swim, but they should speak to their diabetes healthcare team if they have any questions or concerns when starting swimming.

Avoid:

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

Remember:

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

Specific tips for participating 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.

Diabetes UK guides:

diabetes.org.uk/guide-to-diabetes/managing-your-diabetes/exercise/swimming-diabetes

diabetes.org.uk/diabetes-the-basics

diabetes.org.uk/guide-to-diabetes/life-with-diabetes/travel

Run Sweet: runsweet.com/diabetes-and-sport/swimming/