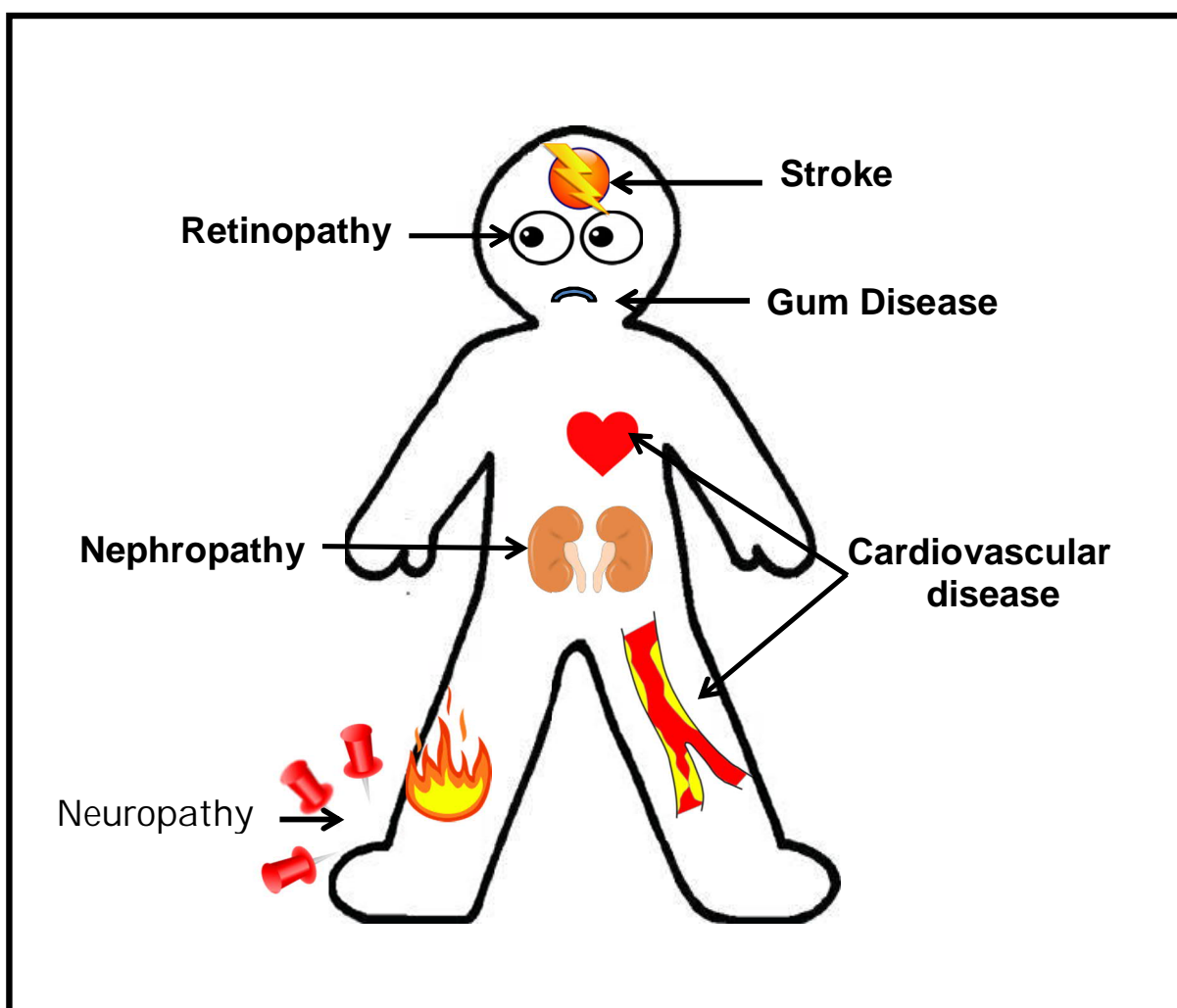




PATIENT INFORMATION

Torbay Children's Diabetes Service

Preventing Diabetes Complications



Diabetes Complications

Thinking and talking about the possibility of long-term complications related to having diabetes can be both worrying and uncomfortable. However, it is important not to avoid it, because there are things you can do to minimise the risk of potential problems, and to help your child to have a healthy future.

What are diabetes related health complications?

High blood glucose levels over a long period of time can harm many parts of the body, but this is not the whole picture; genetics and lifestyle also have a part to play.

The parts of the body which can be affected by diabetes complications include:

- The heart and blood vessels
- Eyes
- Kidneys
- Nerves
- Gums

Most complications are the result of damage to blood vessels. *When small vessels are damaged they are called microvascular complications, and when larger blood vessels are affected they are called macrovascular complications.*

Whilst you can do little about genetic risk factors, the positive message is that you can make a big difference in reducing the complication risk by keeping blood glucose levels as close to the target range of 4-7mmol/l as much as possible, and by eating a well-balanced diet and making healthy lifestyle choices.

There are two ways that we can monitor overall blood glucose control:

- **Average blood glucose**

You can do this at home. Aim for a weekly average of less than 8mmol/l. You can find this information on the Expert meter or on the Diasend download. Please ask if you are unsure of how to find this information.

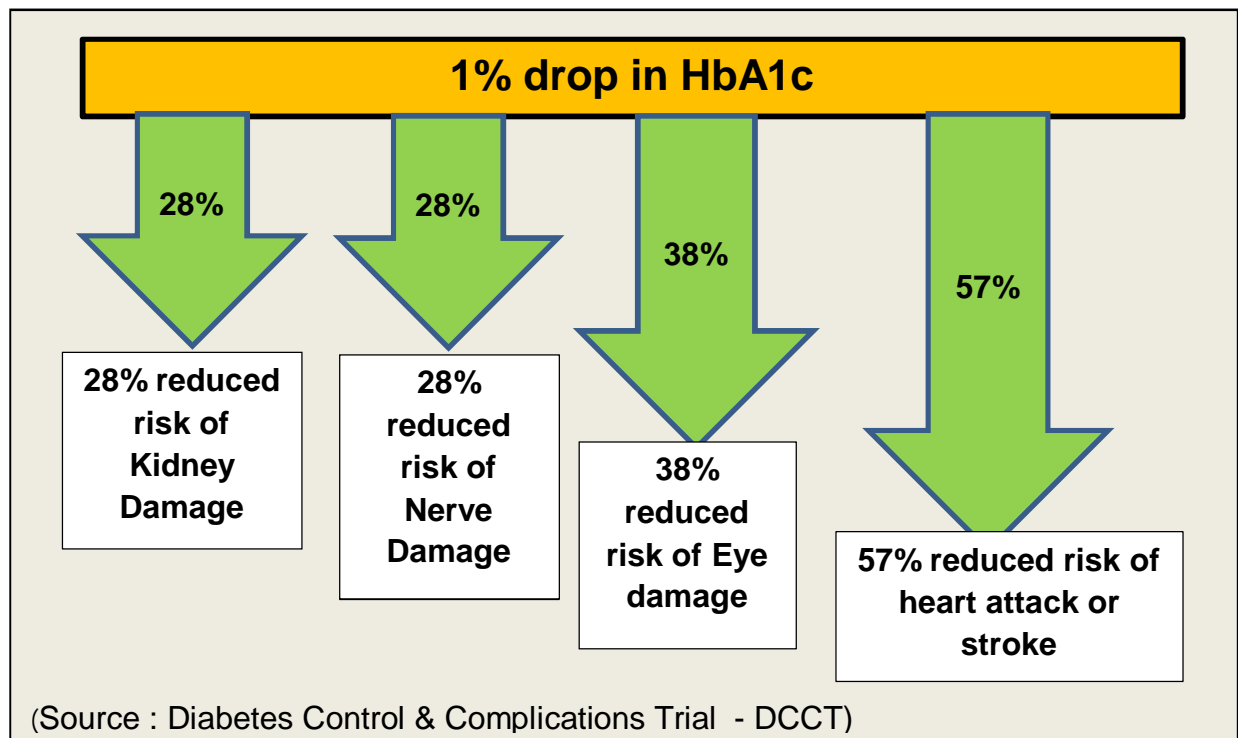
- **HbA1c (Glycosylated Haemoglobin)**

This is a finger-prick test that is taken at each clinic appointment which measures how much glucose has stuck to the red blood cells over a period of 2-3 months. We aim for an HbA1c of less than

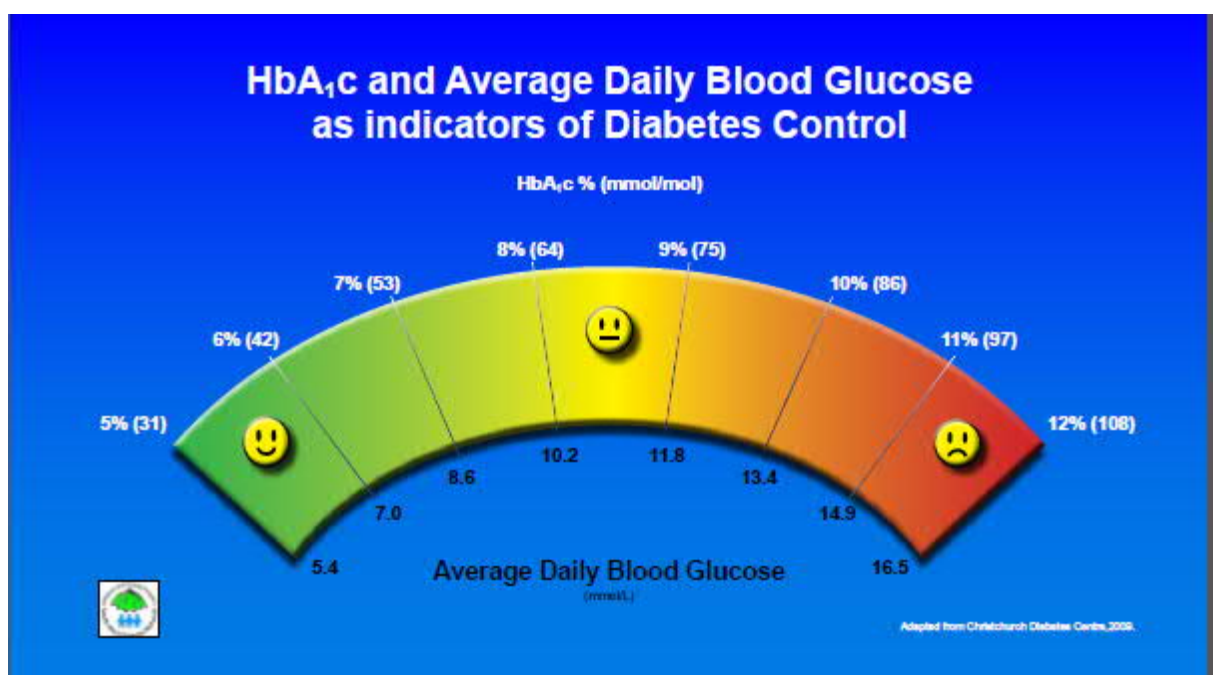
48mmol/mol, as this has been proven to dramatically reduce the likelihood of complications.

It is important to remember that it is never too late to make a difference, and the good news is that even small reductions in HbA1c can reduce the risk of complications a lot.

The diagram below shows how much difference a reduction in HbA1c of just 1% (or 10mol/mol) can make to the risk of developing long-term complications.



In clinic we use the chart below to illustrate how HA1c and average blood glucose relate to each other



Complications explained and how you can prevent them

Eye Problems

1. **Retinopathy** – the retina is the light-sensitive layer at the back of the eye. High blood glucose levels over time can block or damage the tiny blood vessels here. Sometimes this causes new blood vessels to grow which are fragile and can bleed easily. Although no symptoms may be obvious in the early stages, this can eventually become worse, causing loss of vision and blindness.
2. **Cataracts** – higher blood glucose levels mean that a person with diabetes may also have an increased risk of developing cataracts. Cataracts are when the lens at the front of the eye becomes cloudy and thicker, resulting in blurred vision and difficulty seeing at night.
3. **Glaucoma** – the risk of glaucoma developing later in life increases with diabetes. Glaucoma is where the pressure of the fluid in the eye becomes too high, damaging the retina and optic nerve.

How to Prevent Eye Problems

- Keep blood glucose levels close to the target range
- Attend annual eye screening appointments which are offered to all children and young people over 12 years of age.

If problems are picked up at an early stage they are treatable and often reversible

4. Kidney Problems – Nephropathy

The kidneys clean waste products from the body by filtering the blood.

Over time, high blood glucose levels can damage the small blood vessels causing the kidneys to work less well. This causes waste products to build up in the blood, which can then affect other parts of the body.

There are no symptoms in the early stages of kidney disease, however, small amounts of a protein called albumin can leak out of the kidneys into the urine, and this can be detected by a simple urine test.

Once a year we screen the urine to see if any albumin is present. If there are any signs of problems, things can be done to protect the kidneys preventing them from leading to life-threatening kidney failure later in life.

How to prevent kidney problems

- Keep blood glucose levels close to the target range
- Ensure that annual review appointments are kept and urine screened for albumin (all children and young people over 12 years of age)

Nerve Damage – Neuropathy

Neuropathy is a type of nerve damage which people who have had diabetes for several years can develop. Nerves in many different parts of the body may be affected, including the feet, digestive system, urinary system, eyes and heart.

Symptoms such as tingling, numbness or sharp pains in the lower legs or feet may be present in the early stages. If high glucose levels persist, more serious problems may develop in the future such as ulcers and infections. Although neuropathy is more likely after puberty, it can sometimes be seen in younger children with persistently high blood glucose levels.

How to prevent Nerve Damage

- Keep blood glucose levels close to the target range
- Encourage regular exercise and a healthy diet can also help
- Ensure foot sensation is checked once a year at annual review

If detected at an early stage these problems can be reversible or treatable

Foot Problems

Problems with feet can arise when sensation or feeling is reduced. This can result in minor injuries such as cuts or blisters not being noticed until they have become more serious. Poor circulation will also mean that wounds do not heal as well as they should, and they may become infected.

How to prevent foot problems

- Be foot aware, buy well-fitting shoes, cut toe nails correctly i.e straight not curved, check feet regularly for cuts or blisters or signs of footwear rubbing.
- Be careful about where you walk with bare feet
- Regular exercise helps to maintain good circulation to lower legs and feet
- Smoking will make foot problems worse so talk to your child about the dangers of smoking and already smoke, encourage them to quit

If detected at an early stage these problems can be reversible or treatable

Heart & Blood vessels - Cardiovascular

Having diabetes increases the risk of some cardiovascular diseases such as heart attacks and strokes when the blood vessels which take blood to the heart or brain become blocked.

The blood vessels in the legs and feet can also become blocked which increases the risk of ulcers, and severe infections of the foot, which can result in the loss of toes, feet or legs.

High blood glucose levels are only one part of the risk for blood vessel problems, being overweight and having high cholesterol levels, smoking, not doing regular exercise and family history may also play a part.

How to prevent cardiovascular problems

- Keep weight in a healthy range and eat a healthy diet
- Find a form of regular exercise that can be enjoyed
- Have regular blood pressure and cholesterol checks
- Talk to your child about the dangers of smoking and if already smoking, encourage them to quit
- *If picked up at an early stage, things like blood pressure and high cholesterol levels can be treated*

Gum disease and tooth decay

High blood glucose levels can make the mouth dry, and this encourages plaque to be produced. Plaque is a sticky film which coats the teeth, and harbours bacteria.

Sugary sweets and drinks used to treat hypoglycaemia will also increase the risk of tooth decay.

How to prevent gum disease and tooth decay

- Keep blood glucose levels close to the target range
- Take good care of the teeth, brush and floss every day
- Drink some water after treating a hypo when possible
- Visit your dentist for regular check ups

Points to remember.....

- The risk of any of the complications discussed can be dramatically reduced by keeping blood glucose levels as close to the target range of 4 – 7 mmol
- Even where there are early signs of complications they can be treated or even reversed in some cases
- It is **NEVER** too late to do something - even small reductions in HbA1c make a big difference.
- It is not all about blood glucose levels; healthy diet, regular exercise and not smoking are all important too.
- Children and young people live in the here and now and do not always grasp future risk but you can help them to reduce the risks by
 - supporting them to attend their appointments
 - ensure they have their eyes screened annually (over 12yrs of age)
 - encouraging the whole family to eat a healthy diet
 - not smoking or quitting

All members of the Children's Diabetes Team are here to support you, so do ask if you need any advice.

