

## SCREENING FOR DIABETES COMPLICATIONS



### *What is “Good” diabetes control?*

At clinic we measure the amount of glucose that has stuck to your red blood cells over that 3 month period (HbA1c). If blood glucose levels are mostly high on a daily basis then lots of glucose will stick to the red blood cells and the HbA1c will be high. We aim for a HbA1c between 42-64 mmol/mol (6-8%). If the A1c is above 86 mmol/mol (10%) we know that your body is not getting the insulin it requires to function and grow.

We know that blood sugar levels vary a lot day to day depending on your activities. In adolescence it is even harder to have stable blood sugar levels as the hormones in your body play havoc with the way the insulin works.

The best way to try and keep on top of your diabetes is to monitor your blood sugar levels at least 4 times/day and adjust your insulin doses using an insulin adjustment chart. You need to be writing down your blood glucose levels in a log book and looking at these blood glucose levels at a minimum twice/week to achieve “good” diabetes control. If 60-80% of your daily blood sugar readings are in the target range between 4-8mmol you are doing well.

#### **Key Points**

- The risk of diabetes complications can be minimised by having good long term diabetes control.
- Screening for complications is important to allow early detection
- Smoking increases risk of complications

## **The Importance of Follow Up and Screening**

Risk of diabetes complications increases with longer duration of diabetes, poor blood glucose control, high blood pressure, smoking and if there is a history in the family of diabetes with complications. Complications are rare in children and young people but it is believed that good diabetes control from early on is important and helps establish good long-term habits.

You will be given lab forms in clinic when you are due complications screening. Whilst clinics and different tests can be an inconvenience it really is the only way that we can detect early signs that complications are developing.

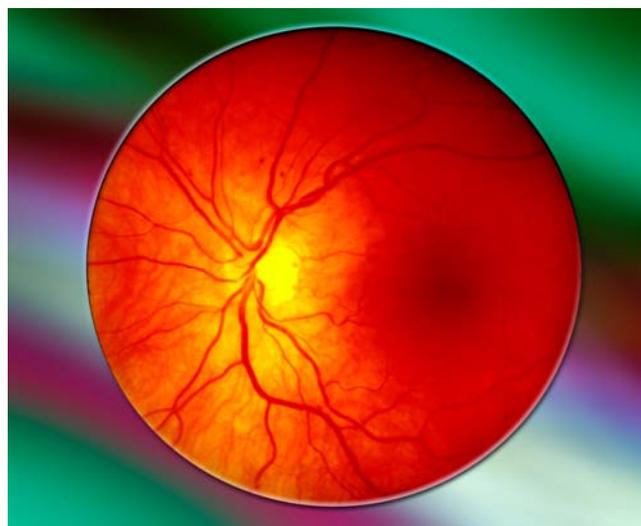
We want you to enjoy life to the fullest and our ultimate goal with your help is to help you stay as fit and healthy as you possibly can.

### ***WHAT ARE LONG TERM COMPLICATIONS?***

When blood sugar levels remain higher than normal, some of this glucose floating around in our blood seems to stick to blood vessels and nerves in our bodies. Eventually the effect of this is that the vessels and nerves have trouble working like they should.

### ***Eyes (Retinopathy)***

The tiny blood vessels which supply blood to our retina (or the bit of the eye that allows us to see) can be affected by long term high blood sugar levels. The vessels become weak as the excess glucose sticks to them until the blood supply to the eye is greatly reduced. If this condition progresses to a stage where vision is impaired, specialised laser treatment can be used to treat the condition. After you transfer to Adolescent Clinic, you will have your eyes checked for retinopathy regularly 1-2 yearly



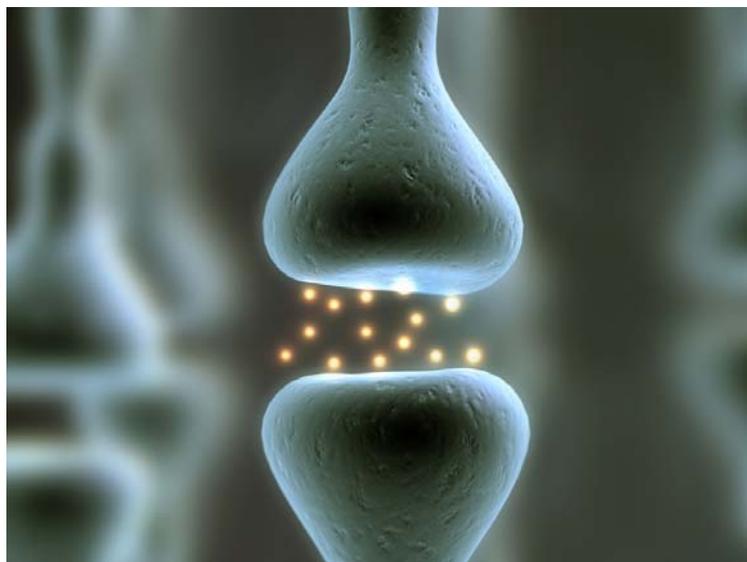
### ***Kidneys (Nephropathy)***

Our kidneys are our body's filtering units getting rid of all the bad stuff and keeping all the good stuff in. The small blood vessels that supply our kidneys can also be affected by long term high blood sugar levels causing gradual damage to the kidneys. It's really important to note that smoking really increases the risk of kidney damage. These days we are able to detect the beginnings of kidney damage very early and there are medications that we can use to prevent any further damage. To make sure we pick up any changes early we regularly test the urine for microscopic amounts of protein and we also keep a close eye on your blood pressure. We screen the urine for this protein (Microalbuminuria) ever year once you transfer to adolescent clinic. You will most likely have your blood pressure checked at every clinic visit.



## **Nerves (Neuropathy)**

Our nerves also do not cope well with excess blood glucose floating around our body. The glucose can get trapped in the tiny areas of the nerves which relay important information to our brains. Again the risks of nerve damage are highest in those who have poor control of their blood sugar levels over a prolonged period of time. It is possible to reverse the effects of nerve damage with improved blood glucose control, but we prefer to prevent it from developing in the first place. To make sure we detect changes early in the process, we can use a selection of highly sensitive tests focussing on reflexes and sensation. These tests will be done yearly if concerns are evident.



## **Vascular Damage**

Older people with diabetes have an increased risk of heart attacks or strokes due to the narrowing of or blockages in blood vessels. Risks are greater in people with untreated high blood pressure, high cholesterol levels or who smoke. Large vessel narrowing can also occur in the penis, causing impotence (problems getting an erection) and in the legs, causing circulation problems. Blood pressure is measured at every clinic visit once you are an adolescent.



## **Medical Conditions that are of higher risk with Diabetes**

### **Thyroid Problems**

An underactive thyroid gland (hypothyroidism) occurs in 3 to 8 per cent of children with diabetes. Symptoms and signs may include tiredness, weight gain, poor growth, problems with diabetes control and an enlarged thyroid gland (goitre). It may be difficult to detect without a blood test. If hypothyroidism is detected it is easily treated by giving thyroid replacement tablets.

Over-activity of the thyroid gland (hyperthyroidism) is also a slightly increased risk with diabetes. Symptoms and signs may include weight loss, nervousness, increased appetite, tremor, problems with diabetes control and an enlarged thyroid gland (goitre). This also can usually be corrected by medications taken in tablets.

All adolescents within the Starship Adolescent Clinic are screened for thyroid disease with a simple blood test every year.

### **Coeliac Disease**

Coeliac disease occurs in about 5 per cent of children with diabetes and is another antibody-related (auto-immune) condition in which the body forms antibodies against the protein gluten which is found in the grains wheat, rye, barley, oats and triticale. These antibodies cause damage to the bowel lining which may cause poor absorption of food, poor growth, unstable diabetes and possible development of bowel tumours in later life. In many children, no symptoms may be evident except unstable diabetes control so most diabetes centres screen for coeliac disease at the time of diagnosis. Adolescents within the Starship Adolescent clinic screen for coeliac disease with a simple blood test every year.

Coeliac disease can be treated by diet changes which involve avoiding the grains containing gluten. This treatment is very effective but adds an extra difficulty to diabetes care. Advice from an experienced dietitian is essential and generally all children with diabetes and coeliac disease will be seen regularly in both diabetes clinics and gastroenterology clinics.

**If you don't understand any aspect of what is covered in this handout please see your Diabetes Nurse Specialist in the Adolescent Clinic**