**The Eyes**

Sight, more than any of our senses, helps us navigate the world around us. In a single glance, lasting a fraction of a second, our eyes work with our brains to tell us the size, shape, colour, and texture of an object. They let us know how close it is, whether it’s standing still or coming toward us, and how quickly it’s moving.

The eyes are small compared with most organs, but their structure is incredibly complex. They work together to perceive depth, enabling us to judge distance and the size of objects to help us move around them. They also work with the brain, muscles, and nerves to produce complicated visual images and messages. They also constantly adapt to the changing environment – for example, adjusting so that we can easily move around in a nearly dark room or bright sunlight.

To understand how the eyes work, it’s important to know about their structure and about conditions and diseases that can interfere with vision.

Light passes through the cornea and the pupil and then passes through the lens, helping to focus the light onto the retina, which is located at the back of the eye. The cells in the retina detect the light and form a focused image which is then sent to the brain by the optic nerve. The macula is a small, specialised area on the retina that helps the eyes see fine details when we look directly at an object. High blood glucose levels can cause damage to the blood vessels of the retina which can then affect vision. A review with the eye specialist every two years is important to get your eyes checked for any problems. Ask for the results of the tests in your next clinic and discuss any concerns you have with you diabetes health care professional.

**Kidneys**

Your kidneys are two of the most important organs in your body. They filter your blood and help get rid of waste products from your body.

Each kidney is about the size of a mobile phone. They have an unusual shape – kidney beans are named after them because they have the same shape.

Inside each kidney there are about a million nephrons. They are tiny filters catching all the stuff that your body doesn’t need and is sending out as waste.

The kidneys do several important jobs which help to keep your body working well.

1. They get rid of waste products carried in the blood. The kidneys are part of the waste disposal team. They check out the minerals, vitamins and other nutrients that you get from your food and send off into urine anything that is not needed. They make urine, send it down to the bladder through tubes called the ureters, and when the bladder feels full enough, the brain sends you off to the toilet to get rid of the urine.
2. They balance the volume of fluid in the body. Adults have around 7-8 litres of fluid in the body, children have slightly less depending on their size. All of this gets filtered through the kidneys many times a day. If the volume of fluid in your body goes down (maybe you are sweating out a lot of fluid through your skin or maybe you are not drinking enough water), the kidneys will not make much urine until the amount of fluid in your body goes up.
3. They can change blood pressure. The kidneys make a hormone that can constrict (make narrower) the arteries in the body. This causes blood pressure to rise when a higher pressure is needed to make sure that blood gets to all parts of your body.
4. They help in making red blood cells. The kidneys make a hormone that tells the body when to make more red blood cells.
5. They produce vitamin D. This vitamin helps the body to absorb calcium from dairy products and some other foods that you eat. Calcium is needed to make strong bones and teeth.

High Blood Glucose Levels (BGL’s) place extra pressure on the filters which can cause them to leak reusable nutrients (things that the body need to function) like protein. This can affect the kidney functions in a bad way and may even lead to kidneys not working properly, if at all. Your diabetes specialist will order urine tests to see if your kidneys are working properly as part of your diabetes screening tests. Don’t forget to ask for the results during your clinic visit and discuss further concerns with your diabetes health care professional.

**Heart and Brain**

Your heart is really a muscle. It’s located a little to the left of the middle of your chest, and it’s about the size of your fist. There are lots of muscles all over your body – in your arms, in your legs, in your back, even in your bottom. The heart muscle is special because of what it does. The heart sends blood around your body. The blood provides your body with the oxygen and nutrients it needs. It also carries away waste and sends this to the kidneys. Most kids are born with a healthy heart and it’s important to keep yours in good shape.

Living with type 1 diabetes can sometimes affect your heart as having high blood glucose levels for a long time can cause the risk of narrowing blood vessels that are important in moving blood around the body to become a lot higher. This can lower the blood flow to the heart and brain. With narrower blood vessels and higher blood glucose levels that make the blood sticky, the risk of blockage increases and you can be put at a risk of heart disease and stroke. These effects can be reduced by following your diabetes management plan as recommended by your diabetes team. Discuss with your diabetes team for any further concerns.

**Nerves**

You might wonder about nerves, which you can’t see without a microscope. What are they anyway? The nervous system is made up of millions and millions of neurons which are microscopic cells. Each neuron has tiny branches coming off it that let it connect to many other neurons. When you were born, your brain came with all the neurons it will ever have, but many of them were not connected to each other. When you learn things, the messages travel from one neuron to another, over and over. Eventually, the brain starts to create connection (or pathways) between neurons, so things become easier and you can do them better and better.

Like the eyes, kidneys, heart and brain, the nerves can be affected by high blood glucose levels. Thicker, stickier blood can damage the walls of the small blood vessels that feed the nerves, especially in the legs. This can cause tingling, numbness, a burning sensation and/or pain. But! This is the bad news! The good news is that it doesn’t have to be this way! Keeping blood glucose levels as near to the target of 4-8 mmol/L and having regular contact with your diabetes team to make sure all screening is done will help to reduce the risk of nerve damage and these symptoms. Discuss with your diabetes health care professional if you have any concerns.