



Prevention of Long Term Complications

What are we trying to prevent? Blood vessel damage or nerve damage are both long term complications of diabetes. Research has shown that the risk of diabetes related complications is **greatly** reduced when the **3 Bs**, Blood glucose levels, Blood fats and Blood pressure are kept as near normal as possible. If the **3Bs** are raised over long periods of time, damage can occur to the blood vessels and the nerves. Routine screening, for these complications and keeping the **3Bs** as near normal as possible gives us the best chance of avoiding them.

What are the 3Bs?

The 3Bs:

- **Blood Glucose Levels:** Aim to keep as near normal as possible. Your personal range will be determined by you and your team. There are 2 methods of monitoring blood glucose levels, self blood glucose monitoring (SBGM) and A1c
 - SBGM Discuss what blood glucose levels are satisfactory and achievable for you with your diabetes team.
 - Aim for your A1c to be less than 7% A1c is the average of the last three months of blood glucose levels. This average is shown as a percentage , eg 7%
- **Blood Fats the Good, the Bad and the Ugly:** Have all your blood fat levels checked regularly. Aim for total cholesterol level less than 4 mmol/L.
 - High density lipids (HDL), **the good** higher than 1.0mmol/L.

- Low density lipids (LDLs), **the bad** less than 2.5mmol/L.
- Triglyceride level **the ugly** less than 1.5mmol/L
- **Blood Pressure:** Have it checked regularly and treated if necessary. Aim for a blood pressure between 110/70 and 130/80

What are the Vascular (blood vessel) Complications?

Vascular (circulation) Complications, can be divided into two:

Microvascular means small blood vessel and the areas which are at risk are:

- **Eyes:**
 - the microvascular complication from diabetes affecting the eyes is known as retinopathy
 - The retina is the lining of the eye. Extra blood vessels can grow into the retina causing bleeding if left undetected and unchecked
 - Retinopathy often has no symptoms until damage has already occurred
 - Signs and symptoms of retinopathy can include floaters in your vision or the appearance of a 'grey curtain'. These signs and symptoms are often **very late** in the development of retinopathy and can almost be too late. At this stage treatment is to preserve remaining eye sight.
 - Treatment for retinopathy includes LASER therapy, which is burning off the extra blood

- **Specific screening** for retinopathy is having your eyes checked by an optometrist, diabetes specialist, eye specialist or GP at least every two years. This will involve having your pupils dilated and having blurry vision for a couple of hours afterwards, you will need someone to drive you home and remember to take sunglasses as the drops can make your eyes sensitive to glare. A good option is having a permanent record of your retina in the form of retinal photography (some eye screening services provide this)
- **Screening is vital given the lack of early warning signs of retinopathy**
- While not considered complications of diabetes (particularly blood vessel), it is recognised that people with diabetes are at higher risk of developing glaucoma (pressure in the eye) and cataracts, therefore these should be checked for at the same time as retinopathy screening.

- **Kidneys:**

- The microvascular complication of diabetes affecting the kidneys is known as nephropathy
- Nephrons are the small filtering units of the kidney and nephropathy is characterized by microalbuminuria.
- Microalbuminuria is the leakage of small amounts of a protein called albumin in the urine
- There are no signs and symptoms of albumin in the urine. If left undetected and unchecked it can increase to macroalbuminuria (large amounts of protein leakage), kidney failure and dialysis.
- Treatment for microalbuminuria is to commence blood pressure medication, even if your blood pressure is normal. The blood pressure tablets help stop the kidneys leaking protein. Early detection can delay dialysis for 20 years or longer.

- **Specific screening** for microalbuminuria is an annual urine test, this can be a fasting spot urine test or an overnight urine collection
- urine albumin <20mg/L, Albumin/Creatinine Ratio (ACR) ≤ 2.5mg/mmol/L for men ≤ 3.5 mg/mmol/L for women

If you have eye or kidney complications it is important that you are checked for the other. Nerves: if the blood supply to nerves is damaged, this then can lead to nerve damage known as neuropathy.

Macrovascular means large vessel disease and the areas which are at risk are:

- Brain (stroke)
- Heart attack
- Peripheral Vascular Disease (PVD), circulation problems to the extremities - feet and less commonly hands
 - Some of the signs and symptoms of circulation problems include:
 - Shiny, pale, hairless skin
 - Pain in the calf when walking, stops with rest
 - Needing to hang your legs down when in bed
 - **Specific screening** for PVD is having your feet checked by your GP, podiatrist, specialist or educator every 6-12 months.
 - Pulses in the ankles and knees need to be felt
 - Temperature and colour need to be examined
 - Your shoes and socks/panty hose will need to be removed

Other complications include:

Erectile Dysfunction

- You may experience erectile dysfunction
- Sexual Health is an important part of your quality of life
- Is an early warning sign of possible future heart disease

- Can be treated, discuss with your doctor

Oral Disease

- People with diabetes are at greater risk of developing dental caries (bad teeth) and gum disease.
- Gum disease can either be shrinkage of the gums or infection in the gums
- **Specific screening** for oral disease see your dentist at least yearly

What are the Nerve Complications?

Nerve Complications or neuropathy, can be divided into two:

- **Peripheral Neuropathy** means nerve damage to the extremities most commonly the feet, but can happen in the hands. Nerve damage can appear in two ways;
 - Numbness, this can happen very, very slowly over 15 years or longer. It is so slow that you may not notice that it is occurring.
 - The numbness can become so bad for example that you may not notice having a cut on your foot. If you don't notice the cut, it is not cared for and it may become infected and lead to an ulcer.
 - Pain, often described as walking on broken glass. Some people say it is worse during the day, and for some it is worse during the night and for some there is no relief day or night
 - People can experience both the numbness and the pain at the same time. Both are late symptoms of nerve damage
 - **Specific screening** for peripheral neuropathy is having your feet checked by your GP, podiatrist, specialist or educator every 6-12 months.

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- Sensation in the soles of your feet needs to be tested
- Checks for corns, calluses, misshapen feet, dry, cracked skin
- Check your feet every day
- Rub moisturiser (except between the toes) every day
- Wear good fitting shoes

- **Autonomic Neuropathy** means nerve damage to the autonomic nervous system. This is the system that works automatically; the nerves which mainly do not need a conscious thought to work. The autonomic nervous system includes nerves that make the heart pump, control blood pressure, the stomach and bowels process and digest food, the bladder to store urine and signal when to go to the toilet. It also affects erectile function.

- Nerve damage can appear in different ways
- Postural hypotension, when you stand up you feel dizzy or faint, because your blood pressure drops too low as you stand
- Your stomach may have delayed emptying, this means that your food sits in the stomach, sometimes for hours, this may have a major impact on your blood glucose levels after meals
- You may experience diarrhoea
- You may have problems emptying your bladder completely
- You may experience urinary or faecal incontinence
- You may experience erectile dysfunction
- Sexual Health is an important part of your quality of life
- Can be treated, discuss with your doctor