If you are living with type 2 diabetes, it is important that your lifestyle has the right balance between the appropriate treatment, regular exercise and a healthy diet.

This booklet will help you to understand your condition and develop the right skills to achieve that healthy balance.

Even if you feel you already manage your diabetes effectively, you may find this booklet to be a helpful source of support and motivation to keep you feeling in control.
What is diabetes?

Our bodies turn most of the food we eat into glucose (sugar). Glucose is then transported around the body where it is used for energy. The pancreas produces a hormone called insulin that controls this process. Insulin helps transfer glucose in the blood into the cells of the body, thereby keeping the amount of glucose in the blood at a safe level.

When you have diabetes, your body either doesn’t make enough insulin, or the insulin produced doesn’t work the way it should. When this happens, your glucose levels are not controlled properly and this causes the amount of glucose in your blood to rise.

What are the different types of diabetes?

Type 1 diabetes: usually develops in children, teenagers, or young adults. In this type of diabetes, the pancreas stops making insulin.

Type 2 diabetes: is the most common form of diabetes and can develop at any age. In this type of diabetes, the body does not make enough insulin and any insulin that the body does makes does not work properly.

Gestational diabetes: can occur during the late stages of pregnancy but usually goes away after the baby is born. Women who have had this type of diabetes are more likely to get type 2 diabetes later in life.
What are the causes of type 2 diabetes?

There are certain risk factors associated with the development of type 2 diabetes – some which are lifestyle related, and some which may be genetic.

The risk factors are as follows:

- You are over the age of 40 years.
- A close member of your family has type 2 diabetes (parent or brother or sister).
- You’re overweight or if your waist is 31.5 cm or over for women; 35 cm or over for Asian men and 37 cm or over for white and black men.
- You have high blood pressure, abnormal cholesterol, or you’ve had a heart attack or a stroke.
- You’re a woman with polycystic ovary syndrome and you are overweight.
- You’ve been told you have impaired glucose tolerance or impaired fasting glycaemia.
- If you’re a woman and you’ve had gestational diabetes.
- The more risk factors that apply to you, the greater your risk of having diabetes.
- Before developing type 2 diabetes, people often develop insulin resistance – a condition whereby fat, muscle, and liver cells do not use insulin properly. At first, the pancreas manages the added demand by producing more insulin. However, as cells in the pancreas begin to work less effectively, the pancreas gradually loses the ability to cope.

What happens in type 2 diabetes?

When you have type 2 diabetes, high levels of glucose (sugar) build up in your blood, which can lead to serious health complications. Therefore, understanding blood glucose control is a critical part of managing your diabetes.

How does type 2 diabetes affect your body?

Type 2 diabetes affects the body’s ability to convert the sugar in the blood into energy. This process is controlled by a hormone called insulin. In type 2 diabetes, either the body does not produce enough insulin, or it does not respond to insulin in the way that it should. This results in glucose levels being left uncontrolled and the amount of glucose in the blood to rise. Too much glucose in the blood can damage the blood vessels, especially in the heart, legs, kidneys, brain and nerves.

What steps can you take to help manage your condition?

- Take time to understand your condition and learn how to monitor your blood glucose levels
- Talk to your doctor about treatment and take any prescribed medication
- Make sure you lead a healthy lifestyle with a balanced diet and regular exercise
Diabetes and the role of insulin

When a person without diabetes eats a meal

1. The GI tract breaks food down into simple sugars called glucose, which it then absorbs. It also releases incretin hormones.

2. The incretin hormones tell the pancreas to release insulin.

3. Glucose travels through the blood vessels to the body’s cells.

4. The body tells the liver to stop making glucose.

5. Insulin helps glucose get into the cells.

6. The kidneys function normally – filtering blood and removing waste. Normally the urine produced by the kidneys does not contain any glucose.

When a person with diabetes eats a meal

1. There may be fewer incretin hormones to tell your pancreas to make insulin after a meal – and some of those hormones that send the message don’t work as well.

2. Your pancreas no longer makes enough insulin – so it works even harder to try to keep up.

3. Too much glucose builds up in your blood.

4. Your liver keeps making glucose.

5. It’s harder for glucose to enter your cells.

6. Your kidneys try to get rid of the excess glucose in your blood. If there is too much glucose in the urine, you may urinate frequently and need to drink more fluids.
Diabetes affects the whole body. When your blood glucose is too high for a long time, it can increase the risk of diabetes-associated complications. These include:

- Eye damage
- Heart disease & stroke
- Nerve damage
- Kidney damage
- Foot problems
- Sexual dysfunction
- Dental disease

The good news is that you can avoid complications by taking good care of your diabetes. This means taking steps to reduce your blood glucose levels by:

- Monitoring your blood glucose
- Developing a healthy living plan
- Making healthy food choices
- Being physically active
- Taking diabetes medications, as prescribed by your doctor
- Lowering blood pressure and cholesterol
- Talking to your doctor or diabetes nurse

If you are taking an active role in managing your diabetes, then you are already making progress towards lowering your risk of diabetes-related problems.
Managing blood glucose

Controlling blood glucose

Research shows that keeping your blood glucose levels close to normal reduces the likelihood of having eye, kidney, and nerve problems. To control your diabetes, you need to keep track of your blood glucose levels, continually checking they are within your target range.

Get the HbA1c test

The HbA1c test is a standard test that shows the average amount of glucose in your blood over the previous 2 to 3 months to give an indication of how well your blood glucose levels are being controlled over time.

For most patients with diabetes the recommended HbA1c target is less than 53 mmol/mol (previously measured as 7%). Your doctor will determine the appropriate HbA1c level for you.

Monitor your blood glucose levels

Use a blood glucose meter to check your glucose. Check both your FPG and PPG.

- **Fasting plasma glucose (FPG)** (also known as fasting blood glucose) is your blood glucose level after at least 8 hours without eating. It is usually taken first thing in the morning.
- **Post-meal plasma glucose (PPG)** (also known as post-meal blood glucose) is your blood glucose level 2 hours after eating.

Monitoring your blood glucose with a meter helps you to see how food, physical activity, exercise and medication affect your blood glucose levels. You should keep a record of your blood glucose levels so that you, your doctor and nurse can monitor your progress.

Blood glucose highs and lows

Understanding your blood glucose range

According to the International Diabetes Federation (IDF), for most people with diabetes, a normal blood glucose range is as follows:

- **FPG**: less than 6.0 mmol/L
- **PPG**: less than 8.0 mmol/L

Talk with your doctor or diabetes nurse about the blood glucose range that is right for you.

High blood glucose (hyperglycaemia)

High blood glucose is usually caused by eating too much, being less active than usual, being unwell or under stress, or needing an adjustment in your diabetes medication.

Common symptoms include dry mouth, thirst, frequent urination, tiredness, and blurred vision.

If you have any of these symptoms, test your blood glucose straight away.

Low blood glucose (hypoglycaemia)

Low blood glucose is usually caused by eating less or later than usual, being more active than usual, or taking diabetes medication that is not matched to your needs.

Common symptoms include feeling nervous, shaky, sweaty, or tired. Symptoms may be mild at first but may worsen quickly if not treated.

If you have signs of low blood glucose, test your blood straight away. If your blood glucose level is less than 3.9 mmol/L, eat or drink a carbohydrate immediately. You may need to repeat the treatment in 15 to 20 minutes if your blood glucose has not risen. Consult your doctor when you experience episodes of low blood sugar.
Treating type 2 diabetes

The importance of treatment

Along with the maintenance of a healthy lifestyle, diabetes treatment can form an important part of controlling your diabetes. Many people require treatment and with so many options available, it is important that you feel comfortable and confident with any medications you are prescribed.

Diabetes treatment options

The first step in treating type 2 diabetes is often a calorie-restricted diet, avoidance of simple sugars, weight loss, and increased physical activity. However, these measures are not always enough to bring your blood glucose levels within their target range.

Treatment and you

A variety of treatment options are available for people with type 2 diabetes. These medications work in different ways to lower blood glucose levels. Your doctor will tell you which kind of medicine is right for you and why.

Treatment options

- **Biguanides**: Decrease the amount of glucose produced by the liver
- **DPP-4 inhibitors**: Work to lower blood sugar by increasing the amount of insulin made by your pancreas and decreasing the amount of sugar made in your liver
- **Insulin**: An injection that replaces the insulin normally made by your body to help control your blood glucose levels
- **Alpha-glucosidase inhibitors**: Slow the rise of blood glucose after meals by slowing the breakdown and absorption of carbohydrates
- **Sulfonylureas and meglitinides**: Stimulate the pancreas to release insulin
- **Glitazones** (also called TZDs): Help the body use insulin and bring glucose into cells
- **GLP 1 Analogues**: Are injections that help your body release insulin when your body needs it

**Oral add on therapy**

Because the treatment options shown above act in different ways to lower blood glucose levels, your doctor may combine two or more oral medications together.
Along with taking prescribed medications, the maintenance of a healthy lifestyle will help you to manage your blood glucose levels and enable you to take an active role in the management of your diabetes.

Making healthy changes successfully

Eating healthily and being physically active will help you to:

- Lower your blood glucose, blood pressure, and cholesterol
- Reduce your risk of heart disease and stroke
- Relieve stress
- Strengthen your heart, muscles, and bones
- Help the insulin in your body to work properly
- Improve your blood circulation
- Keep your joints flexible
- Help you lose weight

Developing your healthy living plan

- Set realistic goals for your weight and exercise plan
- Break a big goal into smaller steps
- Recognise situations that may prompt unhealthy behaviour and try to avoid these
- Reward yourself for special milestones and good progress towards healthy habits
- Involve and seek support from friends and family
- Expect obstacles and setbacks and try to stay motivated

Healthy eating and you

- Develop a diabetes meal plan
- Eat at set meal times
- Reduce salt intake
- Eat a balanced diet
- Keep portions under control

This food plate indicates which food groups you should aim to incorporate into your meal plan, and in which quantities.

- Vegetables: Color Your Plate
  - Eat 3 to 5 servings daily. Vegetables are rich in vitamins, minerals and fibre, and they contain very little fat. Mix and match colours to create a healthful and great-tasting meal. With non starchy vegetables, you can eat as much as you like! Consider fresh, frozen, or low-sodium canned varieties or satisfy your taste buds with refreshing vegetable juice. Vegetables also add flavour to soups and stews and make easy-to-carry, crunchy snacks.
- Meat: Think Small and Lean
  - You need only 113gms (4 ounces) to 170gms (6 ounces) of protein a day. Meat provides the protein your body needs. Have small servings, and look for skinless chicken and lean cuts of meat with little visible fat. Also consider other sources of protein, such as salmon, lentils, pinto beans, tofu, and eggs. One cup of a casserole, such as lasagna, counts as a meat and grain serving.
- Grains and Starches: Yours Grains, Your Way
  - Eat 6 to 11 servings a day. Whole-grain breads, cereal, and pasta are better for you than those made with processed white flour. Healthier foods list whole wheat or another whole grain as one of the first ingredients. Tempt your taste buds with a variety of whole grains, such as brown and wild rice, oats, and corn.
Being active is important for everyone, but it is especially important for keeping your diabetes under control and reducing the risk of complications. Being more physically active does not necessarily mean lengthy workouts or difficult exercises. Here are some ideas for getting started:

- Walking briskly
- Riding a bike
- Gardening
- Walking the dog
- Walking up the stairs instead of taking the lift
- Going to the gym
- Taking a dance class
- Joining a sports club
- Trying something different, like water aerobics or yoga
- Taking up something you enjoy, such as hill walking or golf
For further information please contact your Diabetes Health Care Professional

This information is brought to you by

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Date of Preparation: May 2013