

DIABETES


Living Life to the Full





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**THE MORE INFORMED YOU ARE,
THE BETTER YOU CAN MANAGE
YOUR CONDITION AND CONTINUE
LIVING A HEALTHY, HAPPY LIFE.**

PART 1:

GENERAL INFORMATION ON DIABETES

- By taking care of your diabetes, you can prevent serious complications from occurring.
- The more informed you are, the better you can manage your condition and continue living a healthy, happy life.
- By sharing this booklet with your family and friends, they will be able to understand diabetes better.
- Ask your health care team any questions you might have.

UNDERSTANDING DIABETES

Diabetes is a common, silent lifelong condition in which the body is unable to properly manage, use and store glucose (sugar), which is the main energy source of the body. Glucose is obtained from the food we eat; this could be either from sugary foods and drinks or from the digestion of starchy foods such as bread, potatoes, fruit, and dairy products. The liver can also convert other foods to glucose.

The hormone insulin carefully moves glucose from the blood into the body's cells where it is used as fuel, for energy. Insulin controls the amount of glucose in the blood. Insulin is produced by the pancreas.

Diabetes occurs either because the pancreas does not produce any or enough insulin to help glucose enter the body's cells or the insulin that is produced does not work properly (insulin resistance). Thus, the body will not be able to convert glucose into energy as required.

There are four types of diabetes:

- Type 1 Diabetes Mellitus,
- Latent Autoimmune Diabetes of Adulthood (LADA),
- Type 2 Diabetes Mellitus (the most common type)
- Gestational Diabetes.

Some people have a blood sugar level above the normal range but not high enough for it to be diagnosed as diabetes. This is sometimes known as *Prediabetes*. People with prediabetes have a higher risk of developing type 2 diabetes, heart disease and stroke. With some weight loss and regular moderate physical activity, onset of type 2 diabetes can be delayed or prevented.

It is very important that diabetes be diagnosed as early as possible because, if left untreated, it can cause serious health problems. These include heart and blood vessel disease, damage to the eyes leading to blindness, kidney failure, lower limb amputations and reduced ability to fight infections.

Type 2 diabetes affects a large number of people and is on the rise around the world. People at greater risk are those who have close relatives suffering from type 2 diabetes. Other risks factors include: overweight and obesity, having high cholesterol, high blood pressure and physical inactivity.

The risk of developing diabetes also increases as people grow older (above 40 years of age) and become overweight.

Symptoms

Symptoms can occur because some or all of the glucose stays in the blood and is not being used as fuel for energy. The body tries to reduce blood glucose levels by flushing the excess glucose out of the body in the urine.



Very Thirsty



Always Hungry



Urinating more than usual



Wounds won't heal



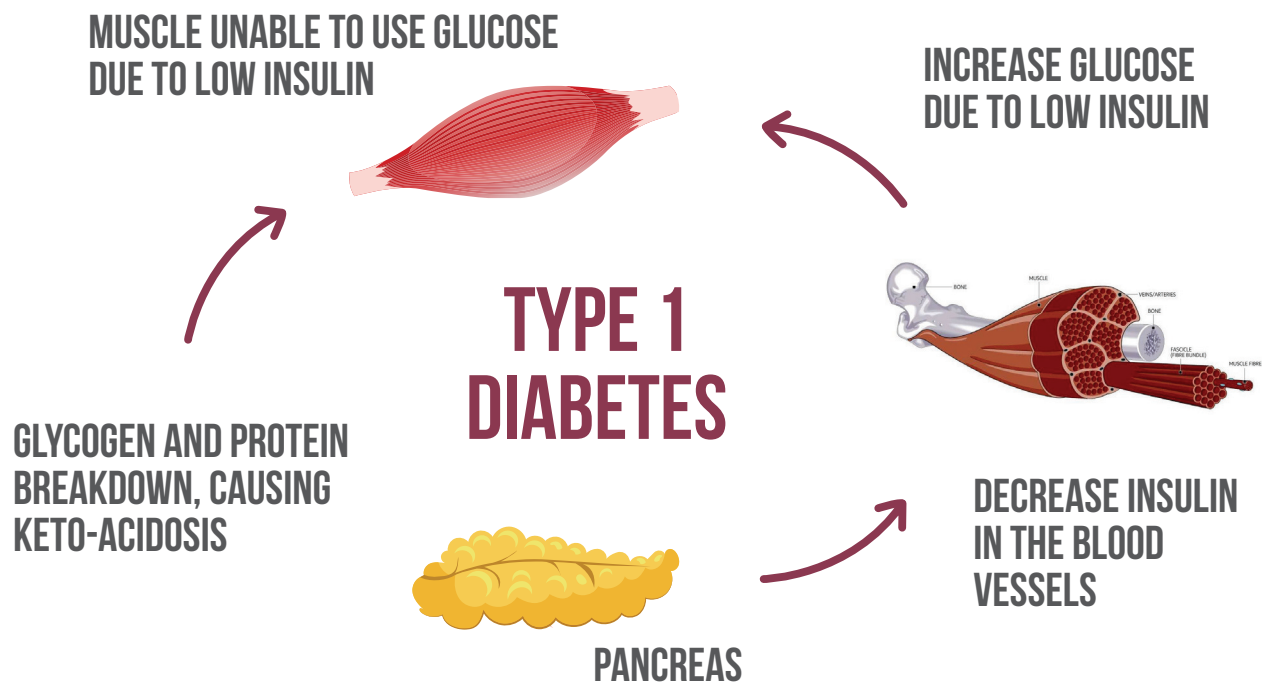
Losing Weight



Blurred Vision

The classic symptoms of diabetes are:

- Increased thirst;
- Increased hunger;
- Increased urination;
- Increased fatigue;
- Wounds or sores that do not heal;
- Numbness of hands or feet;
- Weight Loss;
- Blurred vision;
- Sexual problems;
- Genital itching or regular episodes of thrush (a fungal infection of the mouth and throat).



Type 1 Diabetes

Type 1 diabetes develops when the insulin-producing cells in the body are unable to produce any insulin. It is an autoimmune disease where the insulin producing cells of the pancreas are destroyed. This may be triggered by a virus or other infection. It can develop at any age but usually appears before the age of 40, and especially in childhood. People with type 1 diabetes need to take insulin injections every day.

Latent Autoimmune Diabetes of Adulthood (LADA)

LADA is also called 'type 1 and a half diabetes'. It is a slowly developing form of type 1 diabetes but is sometimes initially mistaken for type 2. People affected are not usually overweight but they may have a family history of another autoimmune disease such as coeliac disease. Healthy eating and regular physical activity are important for people with LADA. Insulin will often be a necessary part of management.

Type 2 Diabetes

This is the most common type of diabetes. In Type 2 diabetes, the pancreas either secretes progressively less insulin, or the insulin produced does not work as well as it should (insulin resistance). Even though this type of diabetes is more common in middle-aged and older people, it is becoming more common in children, adolescents and young people. Some people may not notice any symptoms and diabetes is diagnosed during a routine medical check-up. It is possible for type 2 diabetes to go undiagnosed for several years. It is treated by maintaining a healthy diet, increased physical activity and losing weight if required. In addition, medication and/or insulin may be prescribed.

Gestational Diabetes

During pregnancy, the placenta produces many hormones which help the baby to grow and develop. Some of these hormones may block the action of the mother's insulin resulting in insulin resistance. If the mother is not treated and her blood glucose levels remain high, the baby **may become too large** to be delivered normally. This extra weight of the baby is caused by high levels of glucose in the mother's blood crossing the placenta. Other complications may be a miscarriage or a stillbirth. High blood pressure in the mother due to gestational diabetes may lead to a dangerous condition called pre-eclampsia, a condition which includes high blood pressure, which increases risk of complications or death, for both mother and baby. Babies may suffer from hypoglycaemia soon after birth, have breathing problems or jaundice. Babies born to mothers who had gestational diabetes are also more likely to become obese and develop type 2 diabetes later on in life.

GESTATIONAL DIABETES



- HIGH BLOOD PRESSURE
- HIGH GLUCOSE LEVELS IN MOTHER BRINGS EXTRA GLUCOSE TO BABY
- BABY MAKES MORE INSULIN TO HANDLE THE EXTRA GLUCOSE
- EXTRA GLUCOSE GETS STORED AS FAT AND BABY BECOMES LARGER THAN NORMAL

After delivery, the mother's glucose will return to a normal level but she can be at a higher risk of developing type 2 diabetes later on in life. In fact, these mothers have a 30 to 50 percent chance of developing type 2 diabetes within 10 to 15 years.

Lifestyle changes and choices

Although diabetes cannot yet be cured, it can be managed very successfully. Understanding what happens inside the body will help to understand how some of the treatments work. This is likely to involve lifestyle changes that will have enormous health benefits and allow one to continue normal day-to-day life. Studies have shown that modifying the diet can reduce the high levels of blood sugar in people with diabetes. It is always recommended to adopt a healthy, balanced diet low in fat, sugar and salt with a moderate intake of fruit and a high intake of vegetables and dietary fibre (e.g. red kidney beans, oats and barley). Healthy eating dietary guidelines are available (contact the Health Promotion and Disease Prevention Directorate on 2326 6000)

Eating well

Eating well is always an important part of treatment for diabetes. It can sometimes be challenging to eat a balanced diet and achieve a healthy weight. As a general guide, people living with diabetes should include portions from all the food groups: complex carbohydrates, fruit, vegetables (including non starchy vegetables – cauliflowers, cabbage), legumes (*bigilla*, cannellini and lentils), milk and milk products, meat, fish, eggs, and good fats and oils. Highly processed foods should be avoided. Taking steps towards eating a balanced diet will help to control blood glucose levels, blood fats (including cholesterol) and blood pressure. Seek the advice of a dietitian for more information on healthy meal plans.

PART 2: LIVING WITH DIABETES

WEIGHT MANAGEMENT

Weight reduction is the most effective way of lowering blood glucose levels and improving type 2 diabetes. Significant weight loss can, in some cases, even reduce the effect of the disease. It is not only weight that matters – but also the waist circumference (girth). It is recommended that adult men have a girth below 94 cm and adult women below 80 cm.

Even small and sustainable changes in what one eats, or a small increase in physical activity can lead to weight loss. The best way to lose weight is to adopt a reduced calorie healthy diet, low in fat and maintain a regular eating plan, with controlled portion sizes. Energy intake (from the food and drinks consumed) needs to match energy output (exercise/activity). Eating too much, even healthy foods, can lead to weight gain making it difficult to manage diabetes. Increase in physical activity alongside dietary change can help maximise weight loss.

The Health Promotion and Disease Prevention Directorate in collaboration with Mater Dei Hospital and Primary Health Care provide free group weight management programmes for people living with diabetes. **Please ask your diabetologist (at Mater Dei or Health Centre) or contact the Health Promotion and Disease Prevention Directorate on 23266000 for more information.**

KEEPING ACTIVE

Physical activity combined with healthy eating and any diabetes medication will help manage the condition. Physical activity will help to control and improve the level of sugar in the blood, blood pressure and the level of fat (including cholesterol) in the blood.

Adults aged 18-64 years should carry out at least 150 minutes of moderate intensity aerobic physical activity throughout the week or at least 75 minutes of aerobic vigorous intensity physical activity or a combination of both. This may be broken up into 10 minute bursts throughout the day and should be at a pace where one feels slightly out of breath to gain the full benefits. Examples of aerobic moderate intensity physical activity may include brisk walking, swimming or dancing. Examples of aerobic vigorous intensity physical activity may include running, fast swimming or playing a sport. There are additional health benefits to increasing activity to 300 minutes of moderate intensity physical activity per week. Muscle strengthening activities should also be done involving major muscle groups on 2 or more days a week.

If you are less mobile, there are still benefits from increasing activity levels. Armchair exercises, gentle walking and stretching programmes will all help to keep one as mobile and as fit as possible.

Children and adolescents with type 2 diabetes who are between 10 and 17 years of age should aim for 60 minutes of activity every day. Daily activity can be increased by decreasing screen time (time spent watching TV or in front of the laptop). Children and adolescents should limit screen time to less than 2 hours a day.

Before starting any new activity, it is important to speak to your family doctor or diabetes nurse especially if taking insulin injections. Check blood glucose before, during and after physical activity, as exercise will affect the blood glucose level.

Exercise will also help prevent the long-term complications of diabetes. Activities such as walking, swimming, cycling, gardening and house work can all help. Being active is not only good for the body but will also help to reduce stress.

ALWAYS CARRY GLUCOSE TABLETS WITH YOU AND MAKE SURE YOU CARRY IDENTIFICATION TO SAY YOU HAVE DIABETES.

DIABETES MEDICINES

Most people with type 2 diabetes use medicines to help their blood glucose levels stay within their target range. If the body produces insulin but this does not lower blood glucose levels enough, one or more medicines may also be required. Some people with type 2 diabetes will also need to take insulin to help control their blood glucose levels.

Insulin

The doctor or diabetologist will advise on the amount of insulin which should be taken. A needle attached to a syringe will be needed that can be filled with the dose of insulin. Some people use an insulin pen, a penlike device with a needle and a cartridge of insulin.

Before starting insulin therapy, you will be referred by the doctor or diabetologist to a diabetes nurse or practice nurse for diabetes education. The Diabetes Education Unit at Mater Dei Hospital may be reached on 25455116/7/8/9.

Insulin should be stored carefully according to the instructions so that it remains active and is not damaged. It should be stored in a refrigerator (between 2 °C and 8 °C) and NEVER frozen. When travelling or if the ambient temperature is higher than the recommended temperature for the insulin, insulin should be carried in an insulin cooler pack. Training on injection technique and injection sites, insulin storage and transport will be provided by the diabetes nurse during diabetes training.

It is important to never share insulin needles or pens with anyone, even with family members. Syringes and needles should be disposed of in a **sharps containers**. Sharps containers may be obtained and disposed of at Wasteserv Civic Amenity Sites. Further details may be obtained from the Wasteserv Customer Care Centre on 8007 2200.

Other medicines

Other medicines are often needed to help with problems related to diabetes, such as for heart health, for lowering of blood cholesterol and for high blood pressure. Many people find that keeping a weekly pill box with separate compartments for each day, and even separate boxes for morning, noon and evening, can help.

BLOOD GLUCOSE TESTING

The doctor or diabetes nurse may recommend that your blood glucose is monitored regularly to better manage diabetes. This will help you understand what can affect your blood glucose levels, e.g. food, activity and medication. The doctor or diabetes nurse will recommend the preferred timing for blood glucose monitoring.

Before you start using the blood glucose meter:

- Check the expiry date of the blood glucose strips.
- Ensure that the strips are compatible with the blood glucose meter.
- If the meter requires coding, make sure that the code number is compatible with the blood glucose strips being used.

Before you check your blood glucose level:

- Wash your hands with soap and water, and dry properly.
- Prick your finger to get a drop of blood for testing.
- Use the meter to check the blood glucose level from the drop of blood.

If you are having difficulty maintaining stable blood glucose levels, speak to your doctor or diabetes nurse who will be able to offer you the necessary advice. You should record your results along with a diet diary to help you and your health care professional assess how well your diabetes is being managed. You may also want to record how you felt, and whether you were physically active.

You may need to check your blood glucose levels more often if you are sick, if you change your level of physical activity or if there has been an increase or decrease in the medication. The table below is a general guide to the target blood glucose levels before and after meals.

TYPE 1 AND TYPE 2 DIABETES

Glucose levels before meals 4-6mmol/L

Glucose levels 2 hours after meals below 7.8 mmol/L

At least once a year, you should undergo some extra tests such as HbA1c, which indicates your blood glucose over the previous 2-3 months. The general target is 6.5% or less.

Take your blood glucose records to all visits with the health care team. These will be required for the health professional to make the necessary assessments, dose adjustments and to review the diet plan.

QUIT SMOKING

Smoking is particularly dangerous for people with diabetes as it increases the chances of developing serious health problems of the blood vessels and nerves and can also cause lung and mouth cancer. Giving up smoking is one of the best things you can do for your health. Giving up can be hard but getting the right support will make it easier to quit. If you want to quit smoking, the Health Promotion and Disease Prevention Directorate offers free tobacco cessation services to assist you to stop smoking. Call freephone on 8007 3333 for further information or to make an appointment.

**WHEN DIABETES
IS MANAGED WELL,
BOTH SHORT AND
LONG-TERM
COMPLICATIONS
CAN BE AVOIDED.**

PART 3:

COMPLICATIONS FROM DIABETES

COMPLICATIONS FROM DIABETES CAN BE SHORT OR LONG-TERM.

Short-term complications

a) Hypoglycaemia

Hypoglycaemia, commonly referred to as a 'hypo', means having very low blood glucose levels, that is **less than 4 mmol/l**. Hypos can occur when diabetes is treated with insulin and/or with other diabetes medication. Hypos should be treated immediately. If not treated, symptoms can worsen and the person can become unconscious.

Reasons for a hypo may include:

- Too much diabetes medication or insulin
- Delayed or missed meal or snack
- Insufficient carbohydrates
- Unplanned exercise or activity
- Drinking alcohol without food
- Injecting insulin into the muscle instead of the fat layer under the skin
- Hot weather, hot baths or showers.

Warning signs can include, amongst others:

- Trembling
- Dizziness
- Sweating
- Weakness
- A fast heartbeat
- Paleness
- Hunger
- Mood change / confusion
- Headaches

HOW TO QUICKLY AND EASILY TREAT HYPOS

HOW TO SUPER QUICKLY AND EASILY TREAT HYPOS



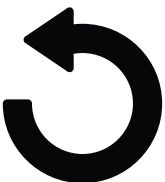
1. Eat or drink **15g** of fast-acting sugary carbs. 1 cup milk (300ml) or ½ cup fruit juice (150ml) or ½ cup soft drink (150ml) or 3-4 gluco tablets.



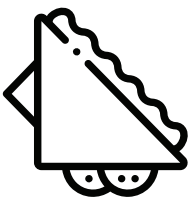
2. Wait for **15 minutes**.



3. Test the blood glucose again to ensure that it has gone up **above 4 mmol/L**



4. If blood glucose is less than 4 mmol/L **REPEAT STEP 1,2** and **3** again.



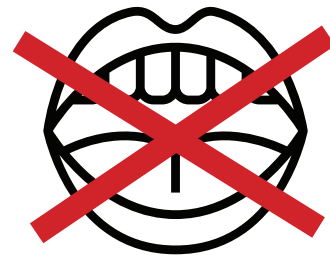
5. If your next meal isn't due, take a snack that contains 15-30 grams of starchy carbs and protein (eg: Sandwich, crackers, biscuits).

WHAT IF THE PERSON IS NOT ALERT?

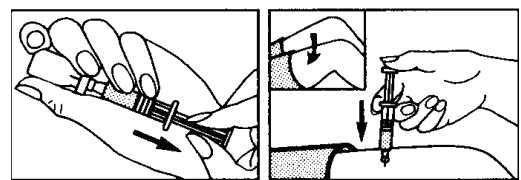
1. Place the person in the **recovery position**



2. Do **NOT** give anything to eat or drink



3. Give the intramuscular **Glucagon injection**

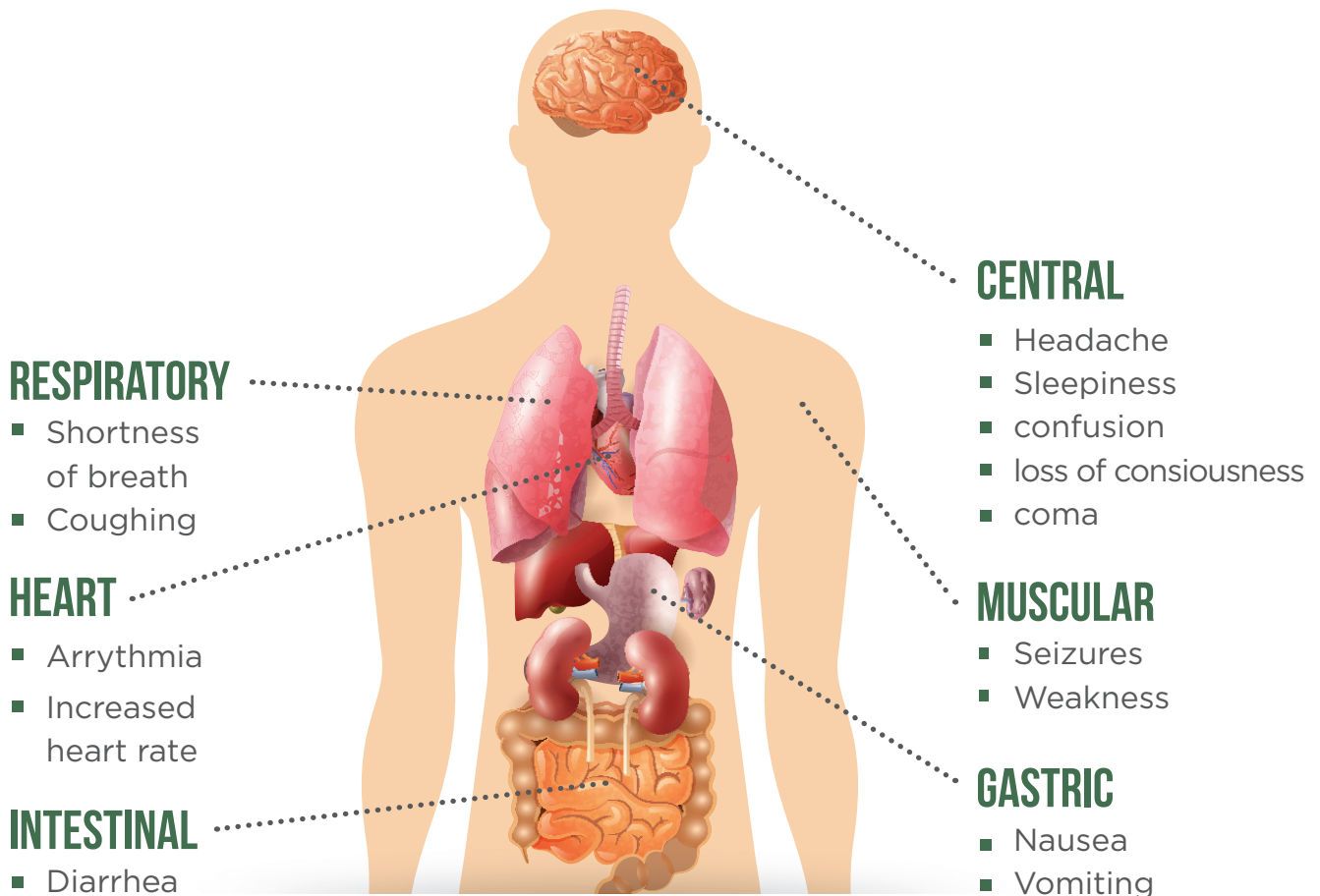


4. If after 10 minutes he/she has not woken up, **call the ambulance**



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SYMPTOMS OF KETOACIDOSIS



b) Hyperglycaemia and Ketoacidosis

Hyperglycaemia means having high blood glucose levels. Consistently high blood glucose levels, if left untreated, can lead to a dangerous condition called ketoacidosis. Symptoms may include, amongst others, nausea and vomiting, drowsiness and eventually loss of consciousness.

Ketosis is a sign of uncontrolled high blood sugar, an indication that there is a lack of insulin in the body or that the person's diet and/or medication is no longer working appropriately. Ketones in the blood are produced during excessive breakdown of fatty acids. If untreated, ketosis can progress to diabetic ketoacidosis (DKA). This happens when the ketone levels become so high that the acid/base balance of the blood changes, making it more acidic. This is a dangerous condition which may result in coma or even death if it is not treated quickly.

Long-term complications

If diabetes is not managed well, it can lead to long-term complications affecting many areas of the body which include the eyes, heart, kidneys, nerves, feet, teeth and gums. It is important to have regular check-ups every year or as required. Your doctor can detect any complications at an early stage so they can be treated more successfully.

a) Cardiovascular disease

This includes heart disease, stroke and all other diseases of the heart and circulation. Poorly controlled blood glucose, blood pressure and blood fat levels increase the likelihood of narrowing and blocking

of the arteries. This is known as atherosclerosis. Atherosclerosis can lead to certain areas being starved of essential oxygen and nutrients. If an artery leading to the heart becomes blocked, it can cause a heart attack. If this happens to an artery leading to the brain, it can cause a stroke and if this happens to an artery leading to the legs, it can cause a deep vein thrombosis. The risk is particularly high for people with diabetes who are also overweight, who smoke and/or who are not physically active.

b) Eye disease (Retinopathy)

Damage to the eye occurs in the retina (the “seeing part of the eye”) and often occurs silently, with very little change to vision until it is advanced. Retinopathy is caused when the blood vessels in the retina become blocked, leaky or grow haphazardly. This damage gets in the way of the light passing through the retina and, if left untreated, can damage vision and lead to blindness. People with diabetes have an increased risk of developing cataracts, glaucoma (increased pressure in the eye), diabetic retinopathy and macular oedema (a disorder of part of the retina).

It is recommended that the eyes are checked annually with a specialised digital camera, which can identify retinopathy. Retinopathy can be treated with laser therapy but this will not restore any vision that has already been lost. Research shows that if retinopathy is identified early, through retinal screening, and treated appropriately, blindness can be prevented in the majority of people at risk.

c) Kidney disease (nephropathy)

Kidney disease occurs when the kidneys start to fail. It develops very slowly, over many years. Kidney disease can be a very serious condition, which is why it is very important to detect at its earliest stage. Keeping blood glucose, blood pressure and blood fat levels under control can greatly reduce the risk.

d) Disease of the nerves (neuropathy)

Neuropathy is damage to the blood vessels and nerves, including those in the feet. Nerve damage may show itself as a burning pain or loss of feeling (diabetic neuropathy) while damage to blood vessels may mean that the feet are not getting enough blood supply (peripheral vascular disease). In view of this, foot ulcers and infection may develop without you feeling any pain or be aware of what is happening. Damage to the eyes may worsen this situation since you will not be able to see any changes that are happening to your feet. Diabetes also damages the small vessels of your feet leading to poorer circulation in the feet. This slows the healing of any ulcers. You may also get cramps and pain in your legs and feet.

Damage to the nerves in other parts of the body may occur. This is called autonomic neuropathy and symptoms may include feeling dizzy and fainting when changing position, changes in digestion leading to nausea, vomiting, diarrhoea and bloating, becoming unaware of the symptoms of a hypo, and sexual dysfunction.

Tips for preventing diabetic foot problems

It is important to dry the feet thoroughly especially between the toes. Also check for any changes in the skin between the toes as, if left untreated, it may lead to foot ulcers, infections and, at worst, to amputation of a toe, foot, or a part of the leg.

Cut toenails straight across to avoid ingrown toenails and use a nail file to remove any sharp edges after cutting. A podiatrist should always be consulted to deliver education on the correct technique.

Avoid walking with bare feet or with flip flops but wear shoes that fit properly. See a podiatrist regularly so any problems can be detected early and treated effectively.

Avoid dry, cracked skin by applying a moisturiser, especially on the heels but not between the toes.

It is advised to check the feet regularly for cuts, blisters or grazes as these may not be felt if the nerves in

the feet are damaged. Use a mirror to inspect the feet if they can't easily be reached or seen.

Keep the feet away from direct heat such as heaters, hot water bottles and electric blankets.

Always cover any small cuts with a mild antiseptic and dressing.

Consult your doctor or podiatrist at the very first sign of redness, swelling, lasting pain, numbness or tingling.

When in the sun, always use high protection factor sunscreen on the feet and always wear suitable footwear to protect them.

If it is impossible to check your feet, it is important to be seen by a podiatrist at your Health Centre or at Mater Dei Hospital.

Dental Health

When sugar levels are uncontrolled, the health of the mouth is affected. The reverse is also true in that the health of the gums can affect blood sugar levels. The most common problems in the mouth associated with diabetes are gum disease, dry mouth, oral infections and poor healing. Visit the dentist regularly for a routine check up and cleaning. Inform your dentist that you are diabetic. Always give your dentist an updated list of the medications you are taking.

Tips for avoiding problems with your dental health

Brush your teeth and gums at least twice a day for two minutes. Use a toothpaste which contains fluoride. Make sure that you sleep with a clean mouth.

Ensure you eat healthy foods. It is important to eat before your dental visit.

Make sure your diabetes is well controlled.

Take your diabetes medications as directed by your doctor, even when attending for a dental appointment.

Change your toothbrush at least every three months.

How can you reduce the risk of developing diabetes complications?

1. Maintain blood glucose levels, cholesterol and blood pressure within the healthy range.
2. Monitor blood glucose levels regularly as recommended and alert your doctor of any persistent abnormal changes.
3. Attend regular reviews and discuss any issues with your family doctor.
4. Take all medications as prescribed.
5. Be physically active.
6. Follow a healthy eating plan.
7. Limit your alcohol intake.
8. Lose excess weight.
9. Look after your feet.
10. Quit smoking.
11. Brush your teeth and gums twice a day

**IT IS BETTER TO
MAKE SMALL CHANGES
THAT CAN BE MAINTAINED,
RATHER THAN DRASTIC
CHANGES THAT CANNOT.**

PART 4:

MANAGING DIABETES

1. Some people with type 2 diabetes take tablets called ‘oral hypoglycaemic agents’ which help the body produce insulin and/or use the insulin better. The doctor or diabetes nurse will explain how the medication works, when to take it and, if necessary, how to monitor blood glucose levels.
2. Some people with type 2 diabetes can manage their disease without medication by appropriate meal planning and adequate physical activity.
3. If the body has stopped producing enough insulin, insulin injections may be required. All persons diagnosed with type 1 diabetes have an absolute need for insulin treatment whilst some persons with type 2 diabetes may also be required to take insulin in addition to other medications.
4. Weight loss (around 5-10% of body weight) and regular physical activity (at least 30 minutes a day) are the recommended goals to help improve diabetes control.
5. It is important to have regular meals and to reduce weight slowly by gradually reducing food portion size and snacks in between meals.
6. Since diabetes is a long-term condition, it is important to be in regular contact with the diabetes care team. Regular checks are recommended for the eyes, feet, nerves and mouth as they may also be affected by diabetes.

THE DIABETES HEALTHCARE TEAM

Professional	Time-frame	Reason	Telephone
Diabetes specialist or family doctor with specialist interest in diabetes	Every six months	Review	
Dietitian	At least every year	Meal planning	
Diabetes nurse educator	Every 2-3 weeks after starting insulin till stable; then as necessary	Education	
Ophthalmologist	At least every year	Regular eye examination	
Podiatrist	Every six months	Foot examination and nail cutting	

Psychologist/counsellor	As necessary	Anger/mood management	
Family doctor	When needed	Check ups Blood glucose readings	
Dentist/Dental Hygienist	Every 6 months or as recommended by your dentist	Mouth examination	

If diabetes makes you feel sad or angry, or if you have other problems that worry you, you should talk with a counsellor, a psychologist or a psychotherapist.

Prepare a list of questions before you visit any health professional.

Be sure to understand everything you need to know about your diabetes.

GENERAL ADVICE FOR PEOPLE LIVING WITH DIABETES:

- Control your food portion sizes both for the main meals and snacks;
- Eat snacks in between meals such as plain yoghurt, fruit, unsalted nuts or seeds;
- Do not skip meals especially breakfast;
- Increase the amount of fibre in your diet;
- Eat two portions of fruit and three to four portions of vegetables a day (preferably fresh);
- Cut down on unhealthy fats and saturated fat, sugars such as cake and biscuits and salt such as crisps, chips, fish in batter, pastry, cream, salad dressing and mayonnaise;
- Choose low-fat dairy products, such as skimmed milk and low-fat cheese and yogurts, preferably plain;
- Choose lean meat, cut all visible fat from meat and remove the skin from chicken before cooking;
- Avoid fatty or processed meat e.g. belly pork, chopped ham, sausages and burgers;
- Eat fresh or frozen fish at least twice a week; one portion should be oily fish;
- Cut down on the amount of sugar you consume;
- Read food labels for a healthier choice;
- Eat less salt - try to eat less than 5g of salt per day (less than a teaspoon);
- Flavour foods with alternatives to salt e.g. black pepper, herbs, spices, vinegar, lemon or mustard seeds;
- Grill, bake, poach, boil, steam or use a casserole instead of frying;
- Keep well hydrated - aim to drink between 1.5 and 2 litres of fluid every day (consult your doctor about your hydration levels) ;
- Limit the consumption of alcohol;

- Try to do at least 30 minutes of physical activity daily;
- Have regular check ups with your doctor;
- Brush your teeth and gums twice a day for 2 minutes
- Monitor blood sugar at home;
- Quit tobacco
- Always carry a snack in your bag in case you are out for a very long time;
- Always carry glucose tablets with you in case of emergency;
- Always carry a diabetes card with you;

Know the signs of having a hypoglycaemic attack and explain the symptoms and treatment needed for hypoglycaemia to a friend, your teacher or your co-workers since you might need their help if your blood glucose levels drops too low.

PART 5:

EATING WELL WHILE LIVING WITH DIABETES

Ten steps to eating well

1. **Eat three meals a day**

Avoid skipping meals and spread your breakfast, lunch and evening meals over the day. Missing meals, especially breakfast, can lead to unplanned and excessive snacking later. If you feel you need something to eat in between meals, choose low-fat snacks such as fruit, vegetables, or low-fat yogurt. This will not only help control your appetite but will also help you to regulate your blood glucose levels. Remember to stay hydrated throughout the day by drinking water at regular intervals.

2. **Include starchy, carbohydrate foods in each meal**

The amount of carbohydrates you eat is important to control your blood glucose levels and the amount of carbohydrates that your body needs varies depending on your age, weight and activity levels.

How do carbohydrates affect the body?

The amount of carbohydrates consumed has a direct influence on your blood sugar levels. Carbohydrates are present in starchy foods such as bread, pasta, rice, potatoes, beans and pulses, as well as in fruit, some vegetables, some dairy foods and sugars. A diet followed by a person living with diabetes has to focus on the amount of carbohydrates eaten or how quickly those carbohydrates are broken down in the body.

Carbohydrates are broken down into glucose, so when they are consumed an increase in blood glucose levels occurs. Glucose is an essential fuel for the body, especially the brain. Extra glucose is absorbed in cells, turned into glycogen and stored as fat.

The best way to include carbohydrates in your diet is to spread them evenly over the day so that your energy levels remain steady and you do not experience big spikes in your blood glucose.

The best way to regulate your carbohydrate intake is to “count the carbohydrates” in your food.

CARBOHYDRATE COUNTING

Carbohydrate counting, or “carb counting,” is one of many meal planning options for managing blood glucose levels for those on insulin and some diabetes medication. Carbohydrates are counted in grams, which is a measure of weight, and matched to your insulin dose. Even a few grams can make a difference in your blood sugar reading. It may give you more choices and flexibility when planning meals. Your diabetologist or dietitian will explain carbohydrate counting and give you published materials.

Learning to read food labels will guide you on the amount of carbohydrates and sugars that are present in that particular food item. The term “total carbohydrates” on the label includes all types of carbohydrates. This is the reading which should be used when counting your intake of carbohydrate.

Types of carbohydrates

Carbohydrates can be either simple (sugars) or complex (starches). In reality, all carbohydrates are made up of chains of glucose rings. In fact, sugars are simple carbohydrates with one (monosaccharide) or two (disaccharide) rings; starches are complex carbohydrates with chains of many rings (polysaccharide).

Carbohydrates have to be broken down into single sugar units in order to be absorbed. Glucose is the most common sugar unit in our bodies. Half of the carbohydrates we eat are in the form of starches (complex). Starch is found in the form of rice, wheat, potatoes and corn. The rate of digestion is important as the longer the carbohydrate chain, the longer it will take, to be broken down.

Fibre

Fibre is a complex carbohydrate. It is the indigestible part of plant food found in fruit, vegetables and in wholegrains. Fibre is bulky and filling and can sometimes slow down the rise in blood glucose levels. For good health, adults need to try to eat between 25 to 30 grams of fibre each day. Fibre contributes to a healthy digestive and cardiovascular system, helps to keep bowel movements regular and helps to achieve a feeling of satiety. In addition, fibre-rich foods can lower the risk of developing heart disease, hypertension and bad cholesterol (LDL low density lipoprotein cholesterol). Fibre can be divided into soluble and insoluble fibre. **Both types of fibre are necessary for good health.**

Soluble fibre

A diet high in soluble fibre is associated with an increased feeling of fullness. Soluble fibre resists digestion and is able to dissolve in the watery contents of the bowel, where it is thickened into a gel-like consistency. It is changed by the bacteria that grow in the bowel to produce gases, lactic acid, and short-chain fatty acids. Short-chain fatty acids go to the liver, where they help to reduce cholesterol levels and change how glucose and fats are used by the body. This is the kind of fibre which helps to lower blood glucose levels.

Insoluble fibre

Insoluble fibre has a local effect on the bowel: it absorbs and holds water, thereby increasing the size and weight of faeces. This increases the frequency of bowel movements, and reduces the time it takes for the food to travel through the bowel. A diet rich in insoluble fibre is associated with a decreased risk of constipation, a reduction in blood pressure and bowel (colorectal) cancer.

It is best to get fibre directly from food instead of from supplements. It is also important to increase fibre intake gradually, to prevent stomach irritation, and to increase the intake of water and other liquid so as to prevent constipation.

SOLUBLE FIBRE – DISSOLVES IN WATER AND SLOW DOWN DIGESTION TO GIVE YOU THAT “FULL FEELING”.	INSOLUBLE FIBRE – ADD BULK TO DIET AND HELP WITH CONSTIPATION, HAVE THAT “LAXATIVE” BENEFIT.
Oatmeal	Barley
Lentils	Couscous
Apples	Brown rice
Oranges	Zucchini
Nuts	Broccoli
Flaxseeds	Cabbage
Beans	Green beans
Dried peas	Dark leafy vegetables
Cucumbers	Root vegetable eg. potato skins
Celery	
Carrots	



The Glycemic Index

The glycaemic index (GI) is a measure that describes the speed at which carbohydrate foods are absorbed and their effect on blood glucose. Many things can affect the GI. A healthy balanced diet containing fibre, especially wholegrains, as well as berries (eg strawberries, mulberries) and vegetables low in refined sugars should help achieve a low GI regimen. The GI cannot tell you if a food is good or bad for you; it is just one tool you need to make good food choices.

It is better to eat foods that are low in the GI scale.

Low GI foods (55 or less)

Low GI foods are slowly absorbed into the bloodstream and are therefore more slowly converted into energy by the body. As a result, they are less likely to cause a rapid increase in blood sugar levels compared to high GI foods,

High GI foods (70 or more)

High GI foods are those that are quickly broken down into glucose, causing blood glucose levels to rise sharply.

Eating more low GI foods leaves you feeling more satisfied for a longer period of time, and less likely to feel hungry before the next meal.

GLYCAEMIC INDEX

LOW GI (LESS THAN 55), MEDIUM GI (56-69) AND HIGH GI (70 OR MORE)

Grains / Starchs		Vegetables		Fruits		Dairy		Proteins	
Rice Bran	27	Asparagus	15	Grapefruit	25	Low-Fat Yogurt	14	Peanuts	21
Bran Cereal	42	Broccoli	15	Apple	38	Plain Yogurt	14	Beans, Dried	40
Spaghetti	42	Celery	15	Peach	42	Whole Milk	27	Lentils	41
Corn, sweet	54	Cucumber	15	Orange	44	Soy Milk	30	Kidney Beans	41
Wild Rice	57	Lettuce	15	Grape	46	Fat-Free Milk	32	Split Peas	45
Sweet Potatoes	61	Peppers	15	Banana	54	Skim Milk	32	Lima Beans	46
White Rice	64	Spinach	15	Mango	56	Chocolate Milk	35	Chickpeas	47
Cous Cous	65	Tomatoes	15	Pineapple	66	Fruit Yogurt	36	Pinto Beans	55
Whole Wheat Bread	71	Chickpeas	33	Watermelon	72	Ice Cream	61	Black-Eyed Beans	59
Muesli	80	Cooked Carrots	39	Strawberry	41				
Baked Potatoes	85								
Oatmeal	87								
White Bread	100								



Understanding the glycaemic load

A better indicator of the effect of particular foods on blood glucose levels is the glycaemic load (GL).

- Low GL= 10 and below
- Medium GL= 11 to 19
- High GL= 20 and above

It is best to aim for a low glycaemic load.

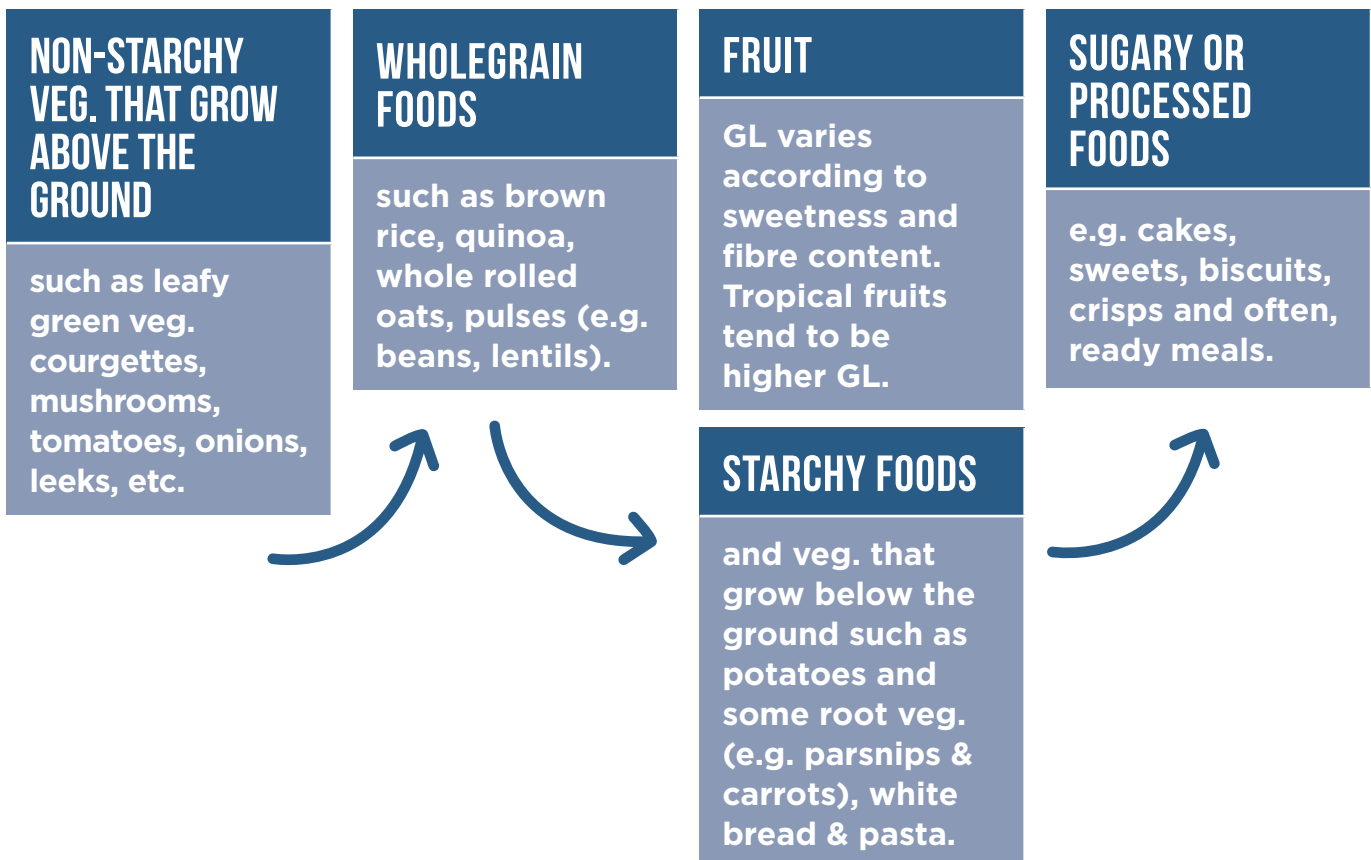
Factors which change Glycaemic Index and Glycaemic load:

The GI/GL appears to be determined by how fast the carbohydrates in the food are broken down. The speed at which this happens can be affected by many factors.

Cooking changes starches; this increases the rate of digestion and raises the GI/GL when compared with the raw form of food.

Foods, such as long-grained rice and oats, are digested at a slower rate.

GLYCAEMIC LOAD (GL) FOOD SUMMARY



LOW GL



HIGH GL

Both fat and fibre can affect how fast starch is digested. For example, the type of fibre found in oatmeal reduces the GI when added to a portion of carbohydrate. On the other hand, fat substantially reduces how fast the meal is digested. This means that the carbohydrate that is also present is not released all at once, keeping insulin and blood sugar levels even. However, one should also control the type and portion size of fats consumed.

3. **Cut down on the fat you eat**

This particularly concerns saturated fats as a low-fat diet has benefits to health. Choose to eat unsaturated fat or oils, especially monounsaturated fat (e.g. olive oil and rapeseed oil) as these types of fats are better for heart health. But remember that all fat contains calories; eating less fat will help the loss of body weight if needed. High cholesterol levels are associated with an increased risk of heart disease.

Here are some tips to help you cut down on the amount of fats that you eat:

1. Grill, poach, boil, steam, oven bake or use a casserole instead of frying or cooking with oil or other fats.
2. Consume less saturated fat by having less butter, margarine and cheese throughout the day.
3. Choose lower fat dairy foods such as: low-fat, low-sugar yogurts, lower fat cheese and lower fat spreads.
4. Cut all visible fat from meat and remove skin from chicken before cooking.
5. Choose chicken, turkey, lean meat and fish as low-fat alternatives to fatty meats.
6. Have boiled or baked potatoes instead of chips.
7. Watch out for creamy sauces and dressings and swap to home-based tomato-based sauces instead.
8. Dress a salad or steamed vegetables with a little olive oil and lemon juice or vinegar.
9. Snack on a handful of unsalted nuts or add some to your salad.
10. Minimize the intake of take away foods and fast foods.
11. Check food labels while shopping.

Fat on food labels

Low fat – contains 3 g or less, of fat per 100g or 100ml

Reduced fat – contains 25% less fat than the standard products but may still be high in fat. Check for salt or sugar content in the product as this may also be high.

4. **Eat more vegetables and fruit**

Eat three to four servings (240 – 320g) of vegetables and two to three servings (160 - 240g) of fruit each day to provide you with the necessary vitamins, minerals, dietary fibre and antioxidants for a balanced diet. Select from a wide variety of vegetables including different colours and type such as spinach, broccoli, cauliflower, tomatoes, bell peppers and cucumber.

Example of one portion of fruit is a medium apple, two plums, or a handful of grapes.

Fruit juice contains vitamins but no fibre, so the natural sugars present are absorbed quickly, causing a rapid rise in blood glucose levels. It is preferable to consume a whole fruit instead of fruit juice.

Water soluble vitamins

Vitamins that can dissolve in water are called water soluble. These are only stored for a short term. Since the body does not store water, excess water soluble vitamins are removed by the body from the kidney in urine.

Fat soluble vitamins

Fat soluble vitamins need to be dissolved in fat before they can be absorbed in the intestine. Since the body stores fat, these types of vitamins can be stored for future use.

VITAMIN	BEST SOURCES	FUNCTION
B-1 (Thiamin)	Whole wheat products, pork, liver and peas	Helps convert carbohydrates to energy
B-2 (Riboflavin)	Meats, fish, whole grains, dairy products, vegetables, legumes	Aids many enzyme reactions that convert food into energy
Niacin	Whole grains, dairy products, liver	Aids many enzyme reactions that convert food into energy
B-6	Meats, fish, nuts, whole grains, fruits, vegetables, legumes	Helps convert protein's amino acids into energy. Synthesizes: amino acids, muscle proteins, haemoglobin, insulin & immune proteins
Folate (also known as: F, B9, Folic Acid, or Folacin)	Liver, kidney, dark green leafy vegetables, fruits, peas & beans	Important for body growth
B-12	Liver, kidney, red meats, dairy products, eggs, fish	Required for body growth, red blood cell formation, maintains brain function
Pantothenic Acid	Liver, kidney, yeast, egg yolks, peanuts, whole grains, beef, skim milk, potato, tomatoes	Helps convert fatty acids into energy. Synthesis of fatty acids, cholesterol, hormones
Biotin	Liver, kidney, egg yolks, milk, yeast	Helps digest carbohydrates and make fatty acids
C (Ascorbic Acid)	Fruits (especially citrus) & vegetables	Aids in wound healing, improves immune system, helps make amino acids, helps iron absorption
Vitamin A (carotene)	Yellow or orange fruits and vegetables, green leafy vegetables, fortified oatmeal, liver, dairy products	Formation and maintenance of skin, hair, and mucous membranes; helps people see in dim light; bone and tooth growth
Vitamin D	Fortified milk, sunlight, fish, eggs, butter, fortified margarine	Aids in bone and tooth formation; helps maintain heart action and nervous system function
Vitamin E	Fortified and multigrain cereals, nuts, wheat germ, vegetable oils, green leafy vegetables	Protects blood cells, body tissue, and essential fatty acids from harmful destruction in the body
Vitamin K	Green leafy vegetables, fruit, dairy, grain products	Essential for blood-clotting functions

5. **Include more beans and lentils**

These cause blood glucose levels to rise less quickly and may help to control blood cholesterol since they are quite high in fibre. Try adding red kidney beans and red or green lentils to stews, casseroles, soups or to a salad.

6. **Aim for about two portions of protein daily e.g. lean meat, poultry, fish, beans, eggs and alternatives**

- a. These foods are a good source of protein, vitamins and minerals.
- b. The type of protein foods consumed should be varied. Red meat should be limited to not more than 2 portions per week.
- c. At least one portion per week of oily fish should be consumed since it contains a type of polyunsaturated fat called omega 3 which helps protect against heart disease. Examples include mackerel, sardines, fresh tuna and salmon.
- d. Vegetarian alternatives to omega 3 fats are found in:
 - i. Ground linseed, rapeseed, soya and walnut oil;
 - ii. Walnuts;
 - iii. Green, leafy vegetables;
 - iv. Soya beans and tofu.

Supplements are not recommended as there is not enough evidence to support their benefit.

- e. Milk and dairy products:

These foods are a good source of calcium, vitamins and minerals and we should include some of them as part of our balanced diet. Many of these foods can be high in saturated fats (which can raise cholesterol) so we should try to opt for small portions. Try to use lower fat cheeses such as ricotta, cottage cheese or Edam cheese. Use skimmed or semi-skimmed milk in place of whole milk. Try to have 2-3 portions each day.

7. **Limit intake of sugary foods and drinks. (Please refer to the 'Are you consuming too much sugar?' leaflet from Health Promotion and Disease Prevention Directorate)**

These foods include full sugar drinks, sweets, chocolate, cakes, biscuits and puddings. Try to use low sugar or sugar-free alternatives instead. Artificial sweeteners, if taken in moderation, can be beneficial in helping to reduce glucose levels when used as part of a low calorie diet. Reduce sugar intake by having smaller amounts of these foods less frequently.

Try:

- a. Drinking plain water instead of sugared beverages;
- b. Plain low-fat or skimmed milk;
- c. Diet/zero or low calorie drinks and squashes;
- d. Low sugar jams and marmalade or small quantities of ordinary products;
- e. Plain, low sugar cereals, e.g. porridge made out of steel cut oats, Weetabix, or branflakes;
- f. Low sugar yoghurts labelled 'sugar free', 'diet', 'light' or plain yoghurt.

If you are eating sweetened foods, aim to have these after food or as part of a meal, not as a snack. Some food products may contain hidden sugars so it is important to check food labels.

Sugary Food Labels

1. Sugar free - contain none or a minimal amount of sugar;
2. No added sugar/ unsweetened - may have natural sugars present;
3. Low sugar - contains no more than 5g of sugar per 100ml or 100g;
4. High sugar – contains over 10g of sugar per 100ml or 100g.

8. **Reduce salt in your diet to 5g or less (less than a teaspoon) a day (Please refer to the 'Salt and Our Diet' leaflet from Health Promotion and Disease Prevention Directorate)**

Cutting down on salt can help you to lower your blood pressure. Diabetics can be at a greater risk of developing high blood pressure, which can lead to stroke and heart disease. Restrict salt intake to 5g per day. Avoid highly salty processed foods (e.g. crisps, bacon, canned and packet soups, processed meat) and try not to add salt at table. Flavour foods with herbs and spices instead of salt. Salt substitutes are not recommended as they do not change your desire for salty food.

9. **Drink alcohol only in moderation (please refer to the 'How much is too much?' leaflet from Health Promotion and Disease Prevention Directorate)**

If you have diabetes and you decide to drink alcohol, limit your intake and avoid drinking more than the recommended daily amounts. Never drink alcohol on an empty stomach. Men and women are advised not to regularly drink more than two standard drinks/units per day although research suggests that men and women should aim to have at least one or two alcohol free days a week.

Alcoholic drinks can often be high in sugar and in calories and can contribute to raised blood glucose levels and weight gain. Try to have low sugar drinks and try to limit the overall intake especially if you are trying to lose weight. High alcohol intake can cause a sudden drop in blood glucose levels (hypoglycaemia) especially if your diabetes is treated with insulin or with certain medications. If you are finding it difficult to control your drinking habits, call Sedqa on 2388 5110.

What is a unit of alcohol?

The definition of a unit of alcohol depends on the percentage (%) alcohol by volume (ABV) of the drink.

A typical unit is:

- 125ml of normal strength wine;
- 25ml or one pub measure of sherry or spirit (vodka, whisky etc);
- Half-pint of normal strength beer, lager, cider, etc.

10. **Avoid diabetic foods or drinks**

They offer no benefit to people with diabetes. They:

- May affect your blood glucose levels;
- Contain just as much fat and calories as non-diabetic foods;
- Can have a laxative effect;
- Are expensive.

**LIVE LIFE TO THE FULL.
TAKE ACTION TO MANAGE
YOUR DIABETES.**

FOR FURTHER INFORMATION, CONTACT:

Diabetes Education Unit, Mater Dei Hospital
Health Promotion and Disease Prevention Directorate
Tobacco Quitline
Maltese Diabetes Association
Diabetes UK

T: 2545 5116/7/8/9

T: 2326 6000

T: 8007 3333

www.diabetesmalta.org

www.diabetes.org.uk

