INFORMATION FOR PEOPLE WITH DIABETES

Diabetes

Diabetes mellitus is a chronic condition caused by too much glucose (sugar) in your blood. Your blood sugar level can be too high if your body does not make enough of the hormone insulin. Insulin is produced by the pancreas (a gland behind the stomach) and moves glucose out of the blood and into cells, where it is broken down to produce energy.

If diabetes is not treated it can cause long-term health problems because the high glucose levels in the blood damage the blood vessels.

There are two types of diabetes.

Type 1 or insulin-dependent diabetes

In type 1 diabetes, the body produces little or no insulin. Someone with this type of diabetes needs treatment for the rest of their life. They must check the levels of glucose in their blood regularly and watch out for complications. Type 1 diabetes is also known as juvenile diabetes, or early onset diabetes because it usually develops before the age of 40, often in the teenage years.

Type 2 or non-insulin dependent diabetes

In type 2 diabetes, the body does not make enough insulin, or cannot use insulin properly. This is called insulin resistance. This type of diabetes is usually linked with obesity. It is sometimes referred to as maturity onset diabetes because it occurs mostly in people over the age of 40.

Diabetes in pregnancy (gestational diabetes)

Some pregnant women have such high levels of glucose in their blood that their body cannot produce enough insulin to absorb it all. This is known as gestational diabetes. It is quite rare affecting less than 1 in 20 pregnant women. Gestational diabetes usually disappears after the baby is born. However, women who develop gestational diabetes are more likely to develop type 2 diabetes later in life.

Diabetes affects 2 million people in the UK and there may be as many as a million more people who have the condition but do not know about it. The risk of developing type 2 diabetes is increased if it runs in your family. Nine out of ten people with diabetes have type 2 diabetes and over 80% of these people are overweight. However, symptoms can develop slowly over time, or not at all. Routine screenings are the most effective way to diagnose the condition.

Symptoms

Without treatment, the main symptoms of diabetes are:

- feeling very thirsty,
- producing excessive amounts of urine (going to the toilet a lot), and
- tiredness, weight loss and muscle wasting (loss of muscle bulk).

Other symptoms can include:

- itchiness around the vagina or penis,
- getting thrush regularly, due to the excess sugar in your urine encouraging infections, and
- blurred vision, caused by the lens of your eye becoming very dry.

Symptoms of type 1 diabetes can develop quickly, usually over days or weeks.

If your blood glucose levels become too high, you can suffer a **hyperglycaemic attack** (excess of sugar and dehydration leading to weakness and possible convulsion). This can happen if you have not taken your insulin. The symptoms of a hyperglycaemic attack include dehydration, drowsiness and a frequent need to urinate. If left untreated, hyperglycaemia can lead to diabetic ketoacidosis, which can eventually cause unconsciousness and even death. Diabetic ketoacidosis occurs when your body begins to break down fats for energy instead of glucose, leading to a build up of ketone acids in your blood (see Selected links for more details).

If your glucose levels become too low you can suffer a **hypoglycaemic attack (hypo)**. This can happen if you have taken too much insulin. Symptoms of a hypo include feeling shaky and irritable and can be brought under control by eating or drinking something sugary, such as a fizzy drink, sugar cubes or raisins, which should stop the attack. After having something sugary, you should then eat a longer-acting carbohydrate food such as a few biscuits or a sandwich.

Symptoms of type 2 diabetes usually develop over weeks or months. Some people with type 2 diabetes have few symptoms or even no symptoms at all. However, they still need to have treatment so that other health problems, such as kidney disease, do not develop later on.

Causes

Diabetes is usually caused by the pancreas (a gland behind the stomach) not producing enough (or any) of the hormone insulin. Diabetes can also be caused by your body being unable to use insulin properly. This is called insulin resistance. In rare cases, diabetes can be caused by a disease of the pancreas called pancreatitis.

Type 1 diabetes

If you have type 1 diabetes, your body is unable to produce insulin, or is not able to produce enough. Type 1 is often referred to as an auto-immune disease. This is because your immune system attacks the cells in your pancreas, destroying them or damaging them enough to reduce insulin production. In some cases, a virus infection

can trigger type 1 diabetes. You are more at risk of developing type 1 diabetes runs in your family.

Type 2 diabetes

If you have type 2 diabetes, your body does not produce enough insulin, or the cells in your body do not react properly to the insulin. Type 2 diabetes is closely linked to obesity. If you are overweight, then losing weight, eating a healthy balanced diet, and taking regular exercise, will greatly reduce your risk of developing diabetes.

You are also more at risk of developing type 2 diabetes if:

- you have high blood pressure or high cholesterol,
- type 2 diabetes runs in your family,
- you are of Asian, Afro-Caribbean or Middle-Eastern background, or
- you are a woman who has given birth to a large baby (over 9 lbs/4 kg).

The risk of developing type 2 diabetes also increases as you get older.

Diagnosis

In order to diagnose diabetes, your GP will ask for a urine sample. This will be tested to see if it contains glucose. A blood test will then confirm the diagnosis, and whether or not your diabetes has an underlying cause, such as high cholesterol.

If your glucose levels are not high enough for your GP to diagnose diabetes, you may need to have an oral glucose tolerance test. This is also sometimes referred to as a glucose tolerance test (GTT). Your GP will give you a glucose drink and take blood tests every half an hour, for two hours to see how your body is dealing with the glucose.

Treatment

Diabetes cannot be cured, but you can control the symptoms in order to help prevent health problems developing later on in life. It is important to diagnose diabetes as early as possible so that you can start treatment. If you experience symptoms, you should see your GP as soon as possible.

Type 1 diabetes

If you have type 1 diabetes, you will need to have regular insulin injections for the rest of your life in order to keep your glucose levels normal. Insulin injections can be administered using a syringe or an injection pen, also referred to as an insulin pen (auto-injector). Most people need either 2-4 injections a day and your GP or diabetes nurse will teach you and/or a friend or relative how to inject the insulin properly.

An alternative to injecting insulin is insulin pump therapy. An insulin pump is a small device about the same size as a pack of cards that holds the insulin. The pump is attached to you by a long piece of thin tubing with a needle at the end, that is inserted under your skin. Most people insert the needle into their stomach, but the hips, thighs,

buttocks or arms can also be used. The pump allows insulin to flow into your bloodstream at a rate that you can control. This means that you no longer need to give yourself injections (see selected links section for further information).

A new device for delivering insulin without using a needle is now available on the NHS. Known as the insulin jet system, it can be used on the stomach, buttocks and thighs. It works by forcing a very small stream of insulin through a nozzle placed against the skin. The insulin travels at such high speed it goes through the skin. Your GP will be able to advise you if this needle free method of insulin delivery is suitable for you.

You will need to regularly check your glucose levels. This can be done at home using a simple finger prick blood test. Your GP will talk to you about your ideal glucose blood level as it varies from person to person, and it also varies throughout the day. The normal blood glucose level is between 4 -7 mmol/l before meals, and less than 10 mmol/l two hours after meals. Mmol/l means millimoles per litre and is a way of defining the concentration of glucose in the blood.

To help reduce the level of glucose in your blood, you should also make sure you have a healthy balanced diet and take regular exercise.

Type 2 diabetes

You can usually control type 2 diabetes by making changes to your diet (see prevention section), losing weight (if you are overweight), and taking regular exercise. Some people with type 2 diabetes may also need to take tablets or have insulin injections.

There are several different types of medicines that are used to treat type 2 diabetes. It may be necessary to take a combination of two, or more, of these medicines to control your blood glucose level:

- **Metformin** this is often the first medicine that is advised for type 2 diabetes. It mainly works by reducing the amount of glucose that your liver releases into the bloodstream.

- **Sulphonylureas** for example, glibelclamide, gliclazide, glimerpirizide, glipizide, gliquidone, increase the amount of insulin produced by your pancreas. They also make your body's cells more sensitive to insulin so that more glucose is taken up from the blood.

- **Acarbose** this slows down the absorption of carbohydrate from the stomach and digestive tract, preventing a high peak in the blood glucose level after eating a meal.

- **Nateglinide and repaglinide** stimulate the release of insulin by the pancreas. They are not commonly used but are an option if other medicines do not control your blood glucose levels.

- **Thiazolidinediones** (glitazones) (e.g. pioglitazone, rosiglitazone) - These make the body's cells more sensitive to insulin so that more glucose is taken up from the blood. They are a third line treatment for people who do not respond to other treatments or in whom other treatments are not suitable.

If you have type 2 diabetes, you need to keep a regular check on your blood glucose levels. This is usually done with a finger prick blood test or sometimes a urine test.

Other treatments

If you have type 1 or type 2 diabetes, you are at risk of developing heart disease, stroke and kidney disease. To reduce the chance of this, you may be advised to take:

- anti-hypertensive medicines to control high blood pressure,
- a statin, such as simvastatin or atorvastatin, to reduce high cholesterol levels,
- low dose aspirin to prevent stroke, and
- an Angiotensin Converting Enzyme Inhibitor (ACE Inhibitor) such as enalapril, lisnopril, or ramipril, if you have the early signs of diabetic kidney disease. This is identified by the presence of small amounts of albumin (a protein) in your urine and is often reversible if treated early enough. For more information on the ACE inhibitor see the selected links section.

You are also advised to have an influenza (flu) vaccine each year and a one-off pneumococcal polysaccharide vaccine (PPV), as these infections can be particularly unpleasant and more serious if you have diabetes.

Regular check-ups

You will need to see your GP, or diabetes nurse, for regular check-ups to see how well you are managing the symptoms of your diabetes. You will have regular blood tests, urine tests, and blood pressure tests. At least once a year your GP should carry out a HbA1c test (glycated haemoglobin). This consists of a blood test that indicates your blood glucose levels for the previous 2-3 months. Your GP will also need to check your eyes, feet and nerves regularly as these can be affected by diabetes (see complications section). Your GP may also refer you to a dietician who will be able to give you advice on maintaining a healthy lifestyle.

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Complications

If diabetes is not treated it can lead to many different health problems. This is because large amounts of glucose can damage your blood vessels, nerves and organs.

Even a slightly raised glucose level that does not cause any symptoms in the short-term can affect your blood vessels, nerves and organs in the long-term. This may lead to complications often years after your diabetes was first diagnosed. These include:

- **Heart disease and stroke** if you have diabetes, you are five times more at risk of heart disease and stroke compared with those without diabetes. Prolonged,

poorly controlled blood glucose levels increases the likelihood of atherosclerosis (furring up and narrowing of the blood vessels). This may result in poor blood supply to the heart, causing angina. It also increases the chance that a blood vessel in the heart or brain will become completely blocked, causing a heart attack or stroke.

- **Retinopathy** (damage to the retina at the back of the eye) blood vessels in the retina of your eye can become blocked, leaky or grow haphazardly. This damage gets in the way of the light passing through to your retina and, if left untreated, can damage your vision.

- **Kidney disease** the small blood vessels of the kidney become blocked and leaky, making the kidneys work less efficiently.

- **Foot problems** damage to the nerves of the foot can mean that small nicks and cuts are not noticed, leading to the development of a foot ulcer. About 1 in 10 people with diabetes get foot ulcers, which can cause serious infection. You should keep your nails short and your feet clean. Wear shoes that fit properly and see a podiatrist or chiropodist (a specialist in foot care) regularly so that any problems are found early.

- **Impotence in men** damage to the nerves can lead to erection problems in men. However, this may be treated using medication.

In general, the risk of developing complications is greatly reduced if your blood glucose level is well controlled and if other risk factors, particularly high blood pressure and high cholesterol are controlled.

Pregnant women with diabetes

Pregnant women with diabetes are at increased risk of miscarriage and stillbirth. If their blood sugar level is not carefully controlled in the early stages of pregnancy, there is also an increased risk of the baby developing a serious birth defect. Pregnant women with diabetes will usually have their antenatal check-ups in hospital or in a diabetic clinic where GPs can keep a close watch on their blood sugar levels, and control their insulin dosage more easily.

Prevention

You may be at risk of developing type 2 diabetes if it runs in your family, or if you are overweight and do not get enough regular exercise. Therefore, to help prevent diabetes, you should eat a healthy balanced diet and take regular exercise.

Healthy diet

A healthy diet is one that is low in saturated fat, salt and sugary snacks and drinks. Try to eat regular meals throughout the day to keep your blood sugar level constant, and eat at least five portions of fruit and vegetables every day.

Reduce how much alcohol you drink

Stopping smoking and reducing your alcohol intake will also help. The Department of Health recommends that adult males should drink no more than 3-4 units of alcohol a day, and that adult females should drink no more than 2-3 units of alcohol a day. However, it is important to remember that alcohol affects different people in different ways. Women tend to have different metabolisms and tend to be lighter than men, which may lead them to have a lower tolerance to alcohol. If you have diabetes, you can still eat foods such as chocolate and sweets as long as you keep your overall diet healthy.

Regular exercise

Ideally, you should take a minimum of 30 minutes of exercise at least three times a week. However, regular exercise does not have to be a chore you can make sure you keep active by walking instead of taking the bus and using the stairs instead of the lift.

Identity bracelet

If you have type 1 diabetes, you should wear an identity bracelet to let others know that you have the condition. This will ensure that if you blackout, or collapse, emergency medical professionals will be quickly made aware that you have the condition. See the symptoms section for details regarding hyperglycaemic and hypoglycaemic attacks.