Central London Community Healthcare NHS
NHS Trust

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YOUR PERSONAL DIABETES RECORD AND CARE PLAN

know diabetes
Live life to the full

PART 1

CONTENTS

This handbook has been developed to help you record and review your test results. By plotting your results on the graphs, you can see at a glance how well you are doing compared with the optimal levels, and adjust your lifestyle accordingly. Review your care plan with your health professional to identify areas that need to be changed.

In this way, every year there should be a steady improvement as you take steps to change. Remember to have a look at your handbook from time to time to remind yourself of what needs to be done and why!

It is also intended that part 2 of this handbook travels with you to all doctor, nurse and other related appointments so that the health professionals can see what blood and urine tests you have had and avoid repeating them.

There are two parts to this booklet – Part 1 which contains explanatory notes and Part 2 which is the actual booklet. It was devised in this way so that you would only have to carry the minimum to your consultations and yet have notes to fall back on should you need them.

Every time you have a test, ask your doctor or nurse for the results and write them in the booklet.

Then record the results on the graph to give you a quick and easy view of how you are doing. An example of a graph is shown on pages 6-7.

In the HbA1c example on pages 6-7, this person with diabetes can see that initially their values are above the recommended level for their health. S/he can see clearly that they need to aim to be in the green range, below 53mmol/mol.

Therefore, despite a few hiccups, this person has managed to bring their HbA1c down within the range by losing weight, being careful with what they eat, exercising and taking their tablets or insulin regularly (all written in their care plan). **This means that their long term risk of getting complications will decrease with every unit by which their HbA1c is lowered.**

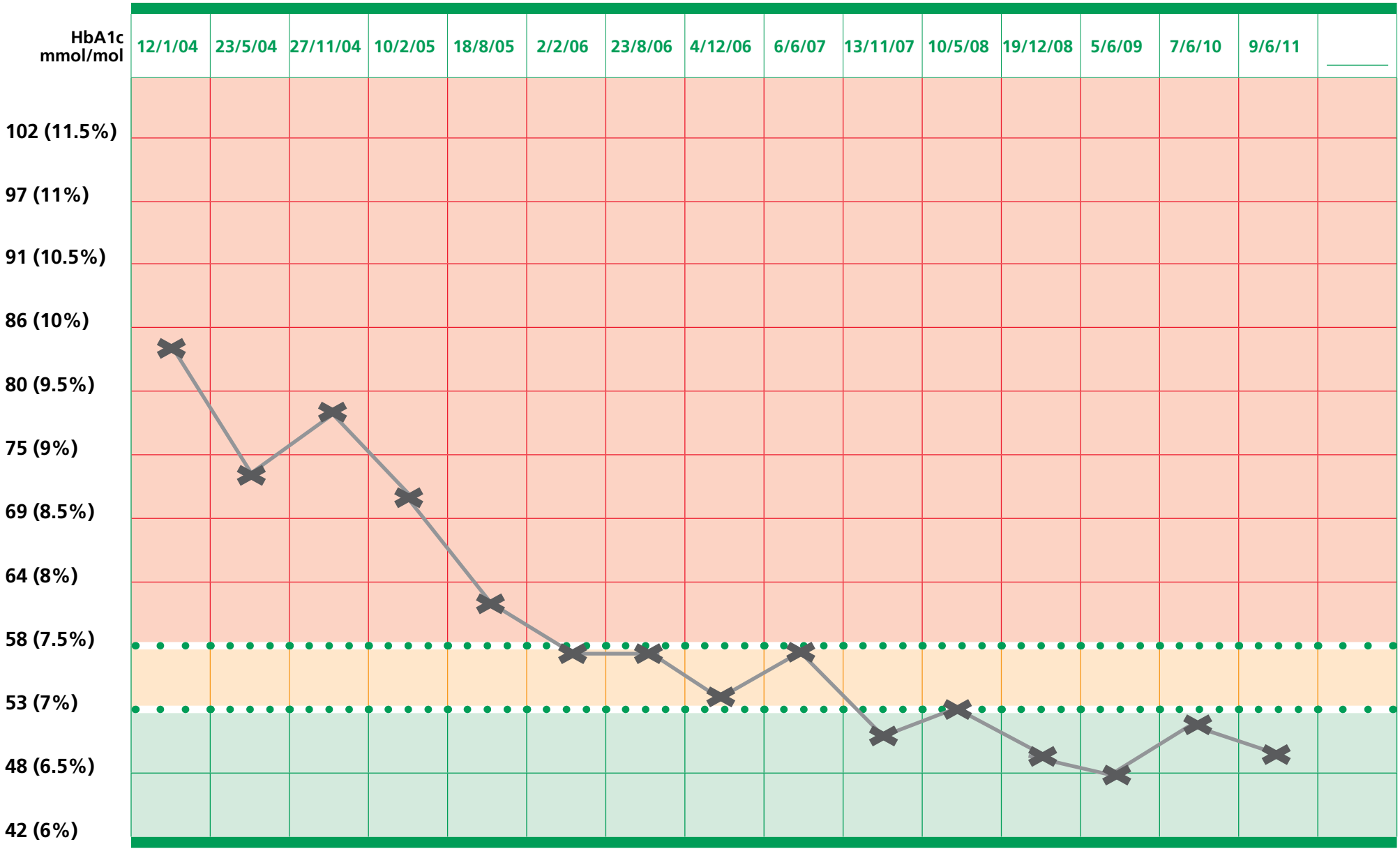
There is no reason why a person with diabetes should not lead a normal life as long as they are careful to live a healthy life, more so than someone without diabetes!

This explanatory booklet is not comprehensive, nor is it individualised, so it is important that you attend all educational events, read around the subject, look at internet sites and talk to other people with diabetes to get as much information as possible.

With diabetes, knowledge is power! The more you understand about the condition, the more you will be able and willing to control it.

Plot your HbA1c result on the graph above.
Try and keep your level below 53mmol/mol (7%)

- National target for good health
- Do I need to take action to improve my health?
- What can I do to improve my health?



The care plan is YOUR individual plan to help you achieve your targets to improve your health. You have a partnership with your healthcare professionals and everyone has your best interests at heart.

At each visit, take the time to set a goal to help improve your health as well as addressing what is stopping you from achieving it. Together, you will be able to identify ways to overcome any obstacles.

You may have one or several goals set at a time, but make sure they are realistic and achievable to avoid feelings of disappointment. Study your test results and think about how you can improve on them if they are not what they should be. Think about how you can change your lifestyle. Use one care plan sheet for each goal set.

Examples of things you may want to change may include: increasing exercise, stopping smoking, losing weight, remembering to take your tablets/insulin, remembering to check your blood glucose levels.

In this way, an agreement is set to optimise your day to day health so that in the long term you can enjoy life with fewer complications.

Goal

What do I need to change? / What is my target?

I need to do more exercise to help me lose weight and help control my glucose levels.

Date today 10/12/2012

Obstacles

Is there anything stopping me changing? How can I be realistic?

- I am so busy at home/work – I have no time.
- Babysitting costs a lot of money.

Action

What exactly am I going to do to achieve my target? (How, what, when, where)

- Take kids to park once a week and run around with them.
- Ask friend to babysit once a week and go for a jog.
- Get off bus earlier and walk the extra distance.
- Go swimming as a family on Sundays.

Outcome

What benefits are there if I can achieve my target?

Increased exercise will help me lose the extra pounds, improve my fitness and reduce my risk of heart disease.

Date of review 10/06/2013

Diabetes is a disorder of metabolism – the way the body uses digested food for growth and energy. The carbohydrate foods that we eat, both starches and sugars are broken down into glucose.

After being absorbed in the gut, glucose passes into the bloodstream, where it is used by cells for growth and energy. For glucose to get into cells, insulin must be present.

Insulin is a hormone produced by the pancreas, a large gland behind the stomach.

When we eat, the pancreas usually produces the right amount of insulin to move glucose from the blood into the cells. In people with diabetes, however, the pancreas either produces little or no insulin, or the cells do not respond appropriately to the insulin that is produced. Glucose builds up in the blood and overflows into the urine. Thus, the body loses its main source of fuel even though the blood contains large amounts of glucose.

There are 3 main types of diabetes:

Type 1

Type 1 diabetes accounts for 10-15% of all people with diabetes.

It is an auto-immune disorder where antibodies attack the pancreas, the organ that makes insulin. The immune system normally makes antibodies to fight off bacteria, viruses, and other germs.
In auto-immune diseases, the immune system makes antibodies against parts of the body. If you have Type 1 diabetes, you make antibodies that attack and destroy the beta cells in the pancreas (the cells that make insulin). It is thought that something triggers the immune system to make these antibodies, but we don't yet know what this trigger is.

Type 1 diabetes occurs most commonly in children and teenagers but can occur at any age.

Before insulin was discovered, people with Type 1 diabetes died – it is therefore vital that they inject themselves with insulin several times a day and follow a careful diet and exercise plan.

Type 2

This is the most common form of diabetes, affecting 85–90% of all people with the condition.

It tends to run in families but lifestyle factors such as **excess weight**, **inactivity** and **poor diet** are the major risk factors for its development.

Most people will have undiagnosed Type 2 diabetes for many years and, by the time symptoms appear, complications may have already developed. People with Type 2 diabetes are twice as likely to suffer heart disease.

Type 2 diabetes may be treated by dietary changes, exercise and tablets. Insulin injections will however be required eventually in the majority of patients.

Gestational Diabetes

This is where a pregnant woman develops gestational diabetes for the duration of her pregnancy and after birth, she returns to normal.

She is, however, at high risk of developing Type 2 diabetes later on in life.

Normally blood glucose levels stay within narrow limits throughout the day: 4.0–8.5mmol/l. They are higher after meals and usually lowest in the morning (having fasted through the night).

In diabetes, the blood glucose level moves outside of these limits unless treated. Even with good control of diabetes, the blood glucose level will still occasionally drift outside this normal range.

The ideal blood glucose values are:

- **4–7mmol/l before meals**
- **Less than 8.5mmol/l, two hours after a meal, if Type 2**
- **Less than 9.0mmol/l, two hours after a meal, if Type 1**
- **Between 5.5 - 7 mmol/l at bedtime**

On a day to day basis you want to avoid the short-term complications such as hypoglycaemia and hyperglycaemia (glucose levels in the blood are too low or too high).

When blood glucose levels are consistently too high or there is an underlying problem, for example, infection or dehydration, then people with diabetes are at risk of serious complications. Diabetic Ketoacidosis (DKA) is a condition that occurs mainly in Type 1 diabetes and Hyperosmolar Hyperglycaemic State (HHS) mainly occurs in Type 2 diabetes. Both are covered in the section on hyperglycaemia.

High blood glucose levels lead to impaired healing of wounds and recurrent infections. By keeping the blood glucose level stable, you significantly reduce your risk of these complications.

When high levels of blood glucose are present for years, it leads to damage to the small blood vessels.

This in turn increases your risk of developing long-term complications including:

- Retinopathy (eye damage)
- Nephropathy (kidney damage))
- Neuropathy (nerve damage))
- Cardiovascular disease, such as heart attack, hypertension, heart failure, stroke and problems caused by poor circulation, e.g. gangrene in the worst cases
- Erectile dysfunction

With **Type 1** diabetes, these complications may start to appear 10 to 15 years after diagnosis.

In **Type 2** diabetes, they usually appear less than 10 years after diagnosis. This is because this type of diabetes goes undetected long before it is diagnosed by your doctor and so by the time it is picked up, the damage has already been done.

- A hypo occurs when your blood glucose level falls below 4mmol/l. Hypos only occur with insulin and certain tablets so discuss with your doctor/nurse whether this applies to you.

- Maintaining correct blood glucose levels is a complex balance between the amount of carbohydrate in your food, the amount of glucose you use up in exercise, and the amount of insulin/tablets you take.

- Causes of hypos are alcohol, stress or illness, hot weather, eating too little carbohydrate, missing meals, exercising more than usual or injecting into a muscle instead of the fatty layer under your skin.

- If you are travelling, you should never drive for more than 2 hours without stopping for a snack and to test your blood glucose level.

- How a hypo feels varies from person to person. You will soon learn how to recognise the early warning signs and what to do.

- Carrying identification telling people you have diabetes will enable others to react if you are unwell.

Hypos

You may experience:

- Sweating -Dizziness
- Hunger -Anxiety
- Trembling -Irritability
- Tingling hands, feet, lips or tongue
- Palpitations (pounding of the heart)

If you have any of these symptoms **you should check your blood glucose level**. If your level is NOT below 4 mmol/l then it is unlikely that you are having a hypo.

Treat a hypo with one of the following sources of sugar:

- Either 4 glucotabs or 5 dextrose tablets
- 3 teaspoons of sugar dissolved in a drink
- 3–6 sugar lumps
- 4 jelly babies
- A sweet drink (not diet) such as 150mls of coke
- 90mls lucozade
- 150mls juice
- 15mls of original ribena (drink diluted)

Repeat in 10 minutes time if still feeling low.

You should then either have **a carbohydrate snack** (e.g. a plain biscuit, a slice of toast or a piece of fruit) or **eat your next meal early.**

ALWAYS carry some form of glucose or sugar around with you.

DO NOT use chocolate to treat a hypo as the glucose release is too slow.

Stronger Hypos

You may experience:

- Headache
- Poor concentration
- Poor coordination
- Blurred vision or staring eyes
- Slurred speech/appearing drunk
- Odd behaviour e.g. being rude or aggressive or tearful
- Confusion

It is important to make sure your family and friends are aware of these signs as you may not feel unwell yourself. They also need to be shown how to help you.

You must act immediately!

- Chew glucose tablets or drink a sugary drink (not diet) or a tablespoon of sugar dissolved in warm water.
- Explain to relatives and friends that they may have to pour the liquid into your mouth and encourage you to drink it, but ONLY if you are awake.
- If you are conscious but unable to eat or drink, someone should smear honey or Glucogel on your gums or the insides of your cheeks and massage it in.

Afterwards, have a snack or eat your next meal early.

Severe Hypos

If you become unconscious family or friends will need to:

- Call immediately for an ambulance.
- Inject you with glucagon if your doctor has prescribed it and provided instructions on how to use it. (This can take 10 minutes to work.)
- Not give you anything by mouth as you may choke.

Checklist

- ✓ Always carry glucose tablets or sugar.
- ✓ Wear diabetes identification bracelet/necklace or carry a card.
- ✓ Inform friends and family about hypos and how they can help.
- ✓ Don't walk or swim long distances alone.
- ✓ Try not to miss meals.
- ✓ Always take your insulin or other diabetes medication.
- ✓ Test your blood glucose regularly.
- ✓ Visit your doctor/nurse regularly to check your diabetes and general health.

What are the signs that you have high blood glucose levels?:

- You feel thirsty
- You need to urinate more often
- You may also feel hungrier than usual
- You often feel more tired and sleepy than usual
- You may have blurred vision
- You may get cramps in your legs
- You may get recurrent infections more easily
- You may lose weight
- If you have a wound, it may take a long time to heal
- Men can suffer from impotence

You can have a moderately high blood glucose level and not experience any of these symptoms. Even so, it can still damage your blood vessels and cause long-term complications. **Therefore, it is important to regularly check your blood glucose levels to know how you are doing.**

Hyperglycaemia can happen after you've eaten a big meal or if you are ill.

Having the occasional brief rise in blood glucose is not usually serious.

There are two very good reasons why you should avoid having hyperglycaemia:

- If you develop extremely high blood glucose, this can become a medical emergency if it's not recognized and treated appropriately.
- **Prolonged periods of even moderately high blood glucose can lead to serious diabetic complications in the future.**

Your blood glucose rises if:

- You forget to take your medication/insulin
- You eat too much carbohydrate at mealtimes
- You are ill and have a fever (see Sick Day Rules)
- You exercise less than usual
- You are under physical or emotional stress
- Your period is due.
- You are taking steroids
- Sometimes it can just be a natural progression of the disease

- Hyperglycaemia occurs when there is too much glucose in your bloodstream. It usually occurs when your diabetes is not being controlled.

- The signs of hyperglycaemia are like the early signs of diabetes. In fact, you may have had some of these signs when you first found out you had diabetes.

- Anything above 10mmol/l is considered high but symptoms may not become noticeable until levels reach 15mmol/l plus.

- If you have Type 1 diabetes and have more than 14mmol/l of glucose in your blood, you should use a urine or blood strip to check for the presence of ketones.

Ketoacidosis is a serious condition that can lead to diabetic coma (passing out for a long time) or even death.

It occurs mainly in Type 1s but rarely can occur in Type 2s.
See Sick Day Rules for more information.

Hyperosmolar Hyperglycaemic State (HHS) occurs in Type 2s who have consistently very high blood glucose levels (often over 40mmol/l).

HHS can develop over days or weeks through a combination of illness, dehydration and an inability to take normal diabetes medication due to the effect of the illness.

Symptoms include:

- Being extremely thirsty,
- Passing a lot of urine,
- Feeling sick,
- Having dry skin,
- Confusion, occasionally seizures can occur and, in later stages, drowsiness and a gradual loss of consciousness.

It is a potentially life-threatening emergency and you must go to hospital to have it treated with a drip, to replace the lost fluids, and insulin to help to bring down the blood glucose levels.

Instructions your doctor may give for when your blood glucose is high include:

- Take an insulin correction bolus as indicated by your doctor
- Test blood glucose frequently to make sure levels are coming down
- Whenever your blood glucose if Type 1 is over 15mmol/l, check urine or blood for ketones
- Always call your doctor when ketones are in the moderate to heavy range
- Limit physical activity and avoid becoming overheated or dehydrated.
- Drink plenty of water or other fluids that do not contain sugar
- High blood glucose can trigger an increase in appetite. Avoid eating carbohydrates and fat until your blood glucose returns to a safe range. Nibble sugar-free sweets, drink fat-free broth, or have a small protein-only snack.

In the eventuality that you become sick, you should have a plan prepared with your doctor/nurse especially if you take insulin to treat your diabetes. (Forewarned is forearmed!) **Here are the basic points to remember when you're unwell:**

Blood Glucose Testing

- Your blood glucose can go up or down, even if you are not eating, so it is important to test your blood glucose every 2–4 hours or at least 4 times a day.
- If your blood glucose levels are over 15mmol/l you may need to increase your dose of tablets or insulin. Get advice from your diabetes team on how to do this.

Testing Blood or Urine for Ketones

If your blood glucose is greater than 14mmol/l, then test your blood or urine for ketones. If they are present you are at risk of developing a serious condition called diabetic ketoacidosis (DKA). (This applies mainly to Type 1s.) This can happen very rapidly – it can happen over a few hours, so it is important to seek help as soon as possible.

When there is not enough insulin in the body to help cells take up glucose to use as energy, the glucose remains in the bloodstream.

This leads to similar warning signs to the presenting symptoms of diabetes but in a much more extreme way:

- Increased thirst
- Increased urination
- Tiredness

The cells, in their desperation to find an alternative energy source, then start to break down fat. This process produces ketones which are acidic and harmful to the body. DKA is a life-threatening condition and requires hospital treatment with fluids (by drip) and intravenous insulin.

Diabetic Ketoacidosis (DKA)

The following symptoms in the presence of a raised glucose level plus ketones suggest that you may be suffering from DKA. This is a medical emergency and you must call an ambulance immediately:

- Vomiting and dehydration
- Shortness of breath (deep and rapid breathing)
- Abdominal pain
- A smell of acetone on your breath (like pear drops or nail varnish)
- Blurred vision
- Dry skin
- Confusion
- Eventually, loss of consciousness (diabetic coma)
- If left untreated, this could result in serious consequences or even death.

DKA can usually be avoided through proper treatment of Type 1 diabetes. However, ketoacidosis can occur even with well-controlled diabetes if you get a severe infection or other serious illness, such as a heart attack. DKA can cause vomiting and increases resistance to the normal dose of injected insulin.

NEVER STOP TAKING YOUR INSULIN!!

The greatest risk for developing ketoacidosis is when you are unwell. When you have an illness or infection, the body reacts by releasing more glucose into the bloodstream, and stops insulin from working properly. Even if you stop eating altogether, or are vomiting, your blood sugar levels can keep rising.

Therefore, monitor your glucose levels more regularly and adjust your insulin accordingly. Do not suddenly stop taking it just because you are not eating. Drink plenty of fluids to avoid dehydration.

Food and Drink

- Drink plenty of unsweetened fluids to avoid dehydration – aim for about 2 litres per day.
- If you can't eat solid food and you're worried you might go hypo, try to replace your usual amount of carbohydrate by sipping sugary drinks or sucking boiled sweets or glucose tablets.
- Try eating small regular snacks if you do not have much of an appetite.

You can substitute carbohydrate food in the form of fluids or easy-to-eat foods such as:

- Milk 1 cup (200mls)
- Fruit Juice 1 small glass (100mls)
- Lucozade 50mls
- Coca-cola (not diet) 150mls
- Soup 1 cup (200mls)
- Jelly (not diet) 2 tablespoons
- Yoghurt (fruit) small carton (125–150g)

Medication

- Don't stop taking your insulin or tablets.
- Consult a doctor first or NHS Direct if: **a)** Your glucose levels are raised higher than normal for you and you are unsure if you need to increase your diabetes tablets or insulin; **b)** You are worried and need advice; better to ask and be safe!
- Rest when ill – exercise will make your glucose levels more unpredictable.

If your blood glucose levels are continuously high, you are vomiting and unable to keep anything down, you have ketones in your urine or if you are unsure about what to do, contact either your diabetes care team or your GP.

Why do I need to have my eyes checked?

When there are prolonged periods of high blood glucose and/or high blood pressure, damage can occur to the tiny blood vessels inside the retina, the light-sensitive tissue at the back of the eye. This damage to the retina is called retinopathy. Initially, these retinal changes are symptomless and can only be picked up by screening (looking at the back of the eye and taking a picture with a camera). Once you have eye changes, they are irreversible. Therefore, it is important for diabetics to have their eyes checked regularly to help prevent further damage and eventual blindness.

Changes in the back of the eye progress from mild to serious and include:

• Background retinopathy
This is the term given to early damage to the retina in diabetes. This type of retinopathy will not cause any problems with your vision, but needs to be monitored by an eye doctor (ophthalmologist), as it can indicate that you are at greater risk of getting further damage to the blood vessels at the back of your eye.

• Pre-proliferative changes
This may affect your vision and you may need laser treatment.

• Maculopathy
The area of the retina we use most is called the macula. It is essential for clear, detailed vision. With diabetes, damage to the macula causes your vision to become blurred; you will be referred for treatment.

• Proliferative retinopathy
At this stage, many of the tiny blood vessels in the retina become blocked. In response to the lack of blood in the retina, new abnormal blood vessels grow which can bleed and cause a reduction in vision. If the blood vessels are left untreated, you could eventually become blind.

• Cataract
A cataract is where the lens, at the front of the eye, becomes opaque and cloudy and interferes with your vision, rather like having grime on the windscreen of your car. People with diabetes are at greater risk of developing cataracts. This requires an operation to remove the lens and replace it with an artificial one.

What can I do to avoid diabetic retinopathy?

Diabetic retinopathy is not entirely preventable, but it's clear that long-term good control of diabetes (HbA1c less than about 53mmol/mol [7%]) helps to slow down progression.

You also need to pay attention to the risk factors for heart disease, because they also affect the likelihood of retinopathy.

You can do this by:

- Stopping smoking;
- Getting blood pressure and cholesterol checked regularly, and keeping them under control. BP would ideally be less than 130/80 and cholesterol under 4mmol/l;
- Having regular eye check-ups;
- Keeping your HbA1c below 53mmol/mol [7%] without having hypos. If your HbA1c has been very high (75 mmol/mol [9%] plus) for some time, you must reduce it slowly (over a year) to prevent a sudden drop which causes more damage to the retina than a gradual decrease;
- Making sure that blood glucose levels are 4–7mmol/l before meals and below 9.0 mmol/l after meals.

What do your kidneys do?

The kidneys are the bean-shaped organs that make urine. They filter the blood and remove waste products of metabolism (such as urea and creatinine) from the body into the urine.

They are also responsible for keeping blood pressure under control by regulating salt and fluid balance. They also release several hormones.

Healthy kidneys do not let protein, which is a relatively large substance, into the urine. Whenever there is protein in the urine, it is a sign that there is damage to the kidneys.

What is nephropathy?

Kidney disease (or nephropathy) is when the kidneys start to fail. In diabetes, this is due to the blood vessels in the kidney being damaged by high blood glucose levels and/or high blood pressure.

The only way to detect the early stages of nephropathy is by attending your yearly check up to get your urine tested to see if there is protein in it, as you will not notice any problems to begin with. There are other reasons for having protein in your urine, such as infection, so often further tests need to be done before you can conclude that nephropathy is the cause.

You should also have two blood tests to look for signs of kidney damage. The urea and electrolytes (U and Es) test is a measure of kidney function (especially blood creatinine) and the estimated glomerular filtration rate (eGFR) measures the rate at which blood is filtered by the kidneys.

If we don't test and treat for nephropathy, then the condition will worsen over the years; the body progressively loses more and more protein in the urine and retains a lot of fluid (oedema), until eventually the person ends up in end-stage renal failure which requires dialysis or a transplant.

To protect the kidneys from further damage, as well as lowering blood pressure, a class of drugs called ACE Inhibitors or AIIRAs are used. Keeping tight control of your blood glucose levels will also help.

The brain is like a central computer that controls all bodily functions. It communicates with the rest of the body via the nervous system. Nerves run from the brain via the spinal cord, which runs through the back and contains thread-like nerves that branch out to every organ and body part.

People with diabetes can, over time, develop nerve damage throughout the body. Some people with nerve damage have no symptoms. **Others may have symptoms such as:**

- Numbness, tingling or pain in the toes, feet, legs, hands, arms, and fingers
- Wasting of the muscles of the feet or hands
- Indigestion, nausea or vomiting
- Diarrhoea or constipation
- Dizziness or faintness due to a drop in blood pressure after standing or sitting up
- Problems with urination
- Erectile dysfunction in men or vaginal dryness in women
- Weakness

It is not known what actually causes nerve damage (neuropathy) in diabetes but hyperglycaemia (high blood glucose) is one of the main contributing factors. It causes chemical changes in nerves that can impair their ability to transmit signals and can also harm the blood vessels that carry oxygen and nutrients to the nerves.

The best way to reduce your risk of developing neuropathy, or prevent it becoming worse, is to keep your blood glucose between 4–7mmol/l before meals and below 9mmol/l after meals. Follow a healthy, balanced diet, take your prescribed medication properly and undertake some form of regular exercise.

Erectile dysfunction (ED) or impotence (the inability to achieve or maintain an erection) is one of the most common sexual problems experienced by men.

It can be caused by stress, tiredness, too much alcohol, as a result of particular surgery, spinal injury, certain medications, diabetes (due to damage to the nerves or blood vessels) or some other medical condition.

One in every ten men living in the UK suffers continuing erection problems. If you are having problems, try to discuss them with your partner – a problem shared, is truly a problem halved.

It is important to talk to your doctor about ED so that s/he can rule out any physical causes as well as consider treatment options. This includes chatting to you about your sex life and checking your blood pressure as well as doing blood tests to check your diabetes control and hormone levels. You may be referred to a specialist.

There are a number of different treatments available, including medication, sex therapy, vacuum therapy, pellets and implants.

How to care for your feet?

- Look at your feet every day to check for problems – cuts, redness, calluses, blisters or sores. Do this especially if you have nerve damage or poor blood flow.
- Wash your feet in warm water every day. Test the water temperature with your elbow to ensure it's not too hot. Dry your feet carefully, especially in between your toes. Rub in lotion after drying,if skin is dry (but not between your toes).
- File corns/calluses with an emery board or pumice stone after your bath.
- Cut your toenails every two weeks or as needed. Cut them to the shape of the toe. Do not cut them too short. File the edges with an emery board.
- Always wear slippers or well-fitting shoes to protect your feet from unseen sharp objects. Break in new shoes slowly. Wear them for 1–2 hours a day for the first few weeks to prevent blisters occurring.
- Wear socks/tights to prevent rubbing from your shoes leading to sores.

An annual review should be carried out by your GP or practice nurse to check for neuropathy in your feet.

Prolonged, raised blood glucose levels lead to a furring up of the blood vessels around the body. A fatty substance is laid down in the walls of the arteries (atherosclerosis) leading to narrowing of the vessels.

People with diabetes have an up to fivefold increased risk of Cardio Vascular Disease (CVD) compared with those without diabetes. This is due to the fact that as part of the metabolic disturbance in diabetes, bad cholesterol levels are raised. High blood pressure, smoking, obesity and physical inactivity are also risk factors for CVD.

When the blood vessels to the heart are narrowed to such an extent that not enough oxygen is getting to the heart muscle, then the person experiences chest pain (angina) or if the vessels are completely blocked, then the pain is much more severe (heart attack or myocardial infarction [MI]).

If the blood vessels to the brain become blocked then you can have a stroke (or if symptoms last less than 24 hours then this is called a transient ischaemic attack or a TIA). Depending on which area of the brain is affected, symptoms will vary:

- Speech could be slurred or there is difficulty finding or understanding words
- There can be weakness, numbness or paralysis down one side of your body
- Vision can be blurred or lost
- The person can become confused.
- Can they raise both arms and keep them here?

If narrowing or blockage occurs in the blood vessels in the legs (and sometimes arms), this is known as peripheral vascular disease (or PVD) and may lead to pain in the calf muscle (intermittent claudication), gangrene or amputation.

How to reduce your risk of CVD:

Exercise at least three times a week. You must exercise at between 60%–70% of your maximum safe heart rate for at least 20 minutes. To work out your maximum safe heart rate, take your age away from 220: e.g. if you are 39 years old, your rate will be 220 – 39 = 181beats per minute (bpm).

- Stop smoking if you smoke. Smoking increases the rate of furring up of the arteries.
- Lose weight if you are overweight – keep your Body Mass Index between 20 and 25.
- Eat a healthy balanced diet full of fresh fruit and vegetables.
- Take your medication as prescribed by your doctor.
- Try to keep your blood glucose levels well controlled: between 4–7mmol/l before meals and less than 9mmol/l two hours after you have eaten.
- Try to keep your blood pressure well controlled – it should be treated if it is above 130/80 mmHg.
- Try to control your blood fats: total cholesterol should be below 4mmol/l, low-density lipoprotein cholesterol (LDL) or 'bad' cholesterol should be below 2mmol/l, high density lipoprotein cholesterol (HDL) or 'good' cholesterol should be 1.0mmol/l or above if you are a man and 1.2mmol/l or above if you are a woman. Triglycerides (a different type of fat) should be 1.7mmol/l or below.
- It may also be beneficial to take a small amount of aspirin – check with your doctor.
- Have regular medical examinations at least once a year.

Travel Check List

Here is a check-list to help you prepare for any trip you take:

- ✔ Vaccinations – check which you need if you are travelling abroad (+/- malaria tablets)
- ✔ Book travel insurance at least 2 weeks before you go and be honest about all medical conditions
- ✔ Take twice the quantity of medical supplies you would normally use for your diabetes in case of emergency
- ✔ Don't forget all your other medication
- ✔ Make sure your travelling companions know what to do if you become unwell
- ✔ Take a leaflet on hypo and hyper glycaemia with you
- ✔ Pack travel sickness and anti-diarrhoea medication
- ✔ Enjoy your holiday!!

Travelling with Insulin

- ✔ Get a letter from your GP or diabetes team for customs explaining why you are carrying syringes and needles. Do you have diabetes identification?
- ✔ Pack extra food and snacks in case of delays. Take glucose tablets and buy sugary drinks in departure lounge (to avoid confiscation in security control) in case of hypoglycaemia.
- ✔ You need cool bags for your insulin. Make sure that all your medication including insulin, meter and lancets travel in hand luggage – insulin freezes in the hold. It can survive at room temperature for one month.
- ✔ Write down the emergency contact numbers for yourself.
- ✔ If you will be away for a long time, check with your insulin manufacturer that they supply your insulin in the country you will be visiting.
- ✔ Also, see if you can find out the phone number of the Diabetic Association in the country you are travelling to.
- ✔ Talk to your healthcare professional about altering your insulin timing when you travel across time zones. Remember, travelling westwards your day will be longer, whereas travelling eastwards the day is shortened.
- ✔ You need a sharps bin to dispose of needles safely.
- ✔ Take your glucose meter, test strips, lancets and finger pricking device; also your needles, syringes or pen device and spare pens. Take a record diary for results.
- ✔ If you are going somewhere hot, remember to keep your insulin in a cool place. You need to monitor your control as insulin absorption may be faster in a warm climate. Keep well hydrated.

It is important to know the law on what you can and can't do so please refer to the Diabetes UK or Driver & Vehicle Licensing Agency (DVLA) websites.

If you have diabetes treated by diet or tablets, it is advisable to **inform the DVLA**. Also, it is important to let your **insurance company** know as well.

The law requires you to notify the DVLA of the following:

- If you are treated by insulin.
- If you have retinopathy (eye problems) or any visual problems.
- If you have peripheral neuropathy (nerve damage to legs or feet.)
- If you suffer more than one episode of severe hypoglycaemia, (needing the assistance of another person) within a 12 months period.
- If you suffer severe hypoglycaemia while driving.
- If you have frequent episodes of hypoglycaemia (low blood glucose levels).
- If an existing medical condition deteriorates or you develop any other condition which may affect you driving safely.
- If you develop impaired awareness of hypoglycaemia.

A few points to help you:

- If you are at risk of developing hypoglycaemia (hypo) e.g. those on sulphonylurea tablets or on insulin, you should ensure that you carry your blood glucose monitor on all journeys as well as diabetic identification.
- Diabetes UK and DVLA recommend that you always check your blood glucose before driving and recheck it every two hours on long journeys.
- If the test result is below 5.5mmol/l eat a snack before driving. If it is below 4.0mmol/l do not drive.
- You should make sure you carry a supply of fast acting carbohydrate (e.g. glucose tablet or a carton of juice or non-diet fizzy drink) in the car.
- You should also carry a supply of longer acting carbohydrate such as fruit, a cereal bar or some plain biscuits to prevent a hypo re-occurring.
- If you experience the symptoms of a hypo (see page 15) whilst driving, you must pull over and stop in a safe place. Remove the keys from the engine and move from the driver's seat. Wait 45–60 minutes before driving again.

Further information:
DVLA www.dvla.gov.uk or 0300 790 6806

Exercise is important for diabetics and non-diabetics alike.

However, it is extra important for people with diabetes for the following reasons:

1. It improves your blood glucose control
2. It reduces the risk of strokes and heart attacks.
3. It lowers cholesterol and blood pressure
4. It helps you burn up calories and so aids weight loss

You should aim to do 30 minutes of exercise on most days of the week. Start slowly and build up steadily the intensity and length of the exercise sessions.

Any exercise you do, whether it be vacuming the house, walking or gardening will help. Try and use stairs instead of the lift or get off a bus stop earlier to increase the amount of walking you do. Just going for a family walk will help.

Before you exercise:

- Check your blood glucose levels. They should be between 7–12mmol/l.
- If levels are below 7, consider eating a snack before you start exercising. If your glucose levels are above 12mmol/l, without ketosis, delay eating during exercise until your glucose levels have fallen.

Do not exercise if ketosis is present.

Checking blood glucose before, during and after exercise:

- Measure your blood glucose before, every 30 minutes during, and at the end of exercise.
- Identify when adjustments in insulin or food intake are necessary. Sudden large changes in insulin doses should be avoided, e.g. if a reduction in insulin is thought to be required, try a 20% reduction in insulin first. Don't jump straight to a 75% reduction.
- Keep snacks that contain carbohydrate readily available.
- Make sure you drink plenty of fluids to maintain hydration.

General safety:

- Avoid exercising alone and alert others to potential signs of hypoglycaemia.
- If you have recently experienced a hypoglycaemic episode, you need to take care as your risk of having another drop in your blood glucose during exercise is increased.

See www.runsweet.com for further information.

Keep your weight down

It is important to keep your weight down, if you have diabetes, as it helps to:

- Improve your control of diabetes,
- Lower your blood pressure and cholesterol levels and
- Lessens the risk of heart disease.
- Type 1 diabetics' insulin requirements can drop dramatically if they lose weight, even by a small amount.

Weight loss from your waistline gives the greatest benefits to your health. Measurements should be:

- **Women:** less than 80cm (32 inches)
- **Men:** less than 94cm (37 inches)
- **Asian men:** less than 90cm (36 inches)

To help you lose weight:

- See a dietician to discuss healthy eating and reducing portion sizes.
- Cut down on alcohol as this is empty calories.
- Increase exercise levels

- If you are thinking about starting a family, it is imperative that you speak to your GP if possible a year before you try to become pregnant, for pre-pregnancy counselling so you can be supported to achieve very good glucose control.

- This is because pregnancy can cause problems for you and for your baby.

- To lessen the risks, it is important to have good glucose control even before you become pregnant. (Less than 5.9mmol/l before meals, rising to no higher than 7.8 mmol/l two hours after eating.)

- The first twelve weeks of pregnancy are the most crucial for the physical development of your baby. Good control during the rest of your pregnancy is also important for the normal growth and maturity of your baby.

Six further things you should do before or as soon as you become pregnant:

1. **Have your eyes checked** before and during pregnancy as pregnancy can put extra pressure on the small vessels in your eyes which can make existing damage worse.
2. **Cut out or cut down alcohol** – too much alcohol can damage your baby. It also affects your blood glucose and can increase your risk of hypoglycaemia.
3. **Review your medication** with your doctor. Some blood pressure or cholesterol tablets should not be taken during pregnancy. Also, if you are a Type 2 diabetic, you will need to switch to insulin for the duration of the pregnancy to control your blood glucose. Some insulins may not be licensed for use in pregnancy so you may need to change brand. Your requirements will also change – as much as or even more than double your usual dosage of insulin whilst pregnant.
4. **STOP SMOKING!** The damage to your baby can last well into their childhood. Diabetics who smoke fur up their arteries far faster than those who don't, leading to many complications earlier in life.
5. **Take 5mg folic acid** – this is a vitamin that prevents spinal cord problems (spina bifida). You need to take this the moment you are considering trying for a baby until the twelfth week of pregnancy.
6. **Eat well** – lots of fresh fruit and vegetables; low fat meat and fish; dairy products for calcium. Bread and starchy foods such as pasta, potatoes, cereals or rice should form the main part of your meals.

For further information, please read the Diabetes UK booklet on 'Pregnancy and diabetes'.

Everyone, whether or not they have diabetes, should eat a healthy diet which is high in fruit and vegetables and low in fat, sugar and salt.

To get the best out of your diet, see a registered dietician, who can give you information specially tailored to your individual needs on what adjustments you may need to make.

There is no need to eat specialist diabetic foods which cost more and have little benefit.

The key to cooking healthily is to:

- Increase your fibre intake by adding pulses, lentils and beans to your recipes as well as eating more wholegrain foods;
- Reduce the amount of fats by using methods other than frying and choosing low-fat ingredients;
- Reduce sugar intake by halving the amount in recipes and substituting with sweetener where applicable; and
- Reduce salt intake by only adding when cooking and not adding at the table. Alternatively, use herbs and spices to boost flavour.

There are 5 food groups that you need to include in your everyday diet:

STARCHY FOODS

These all contain carbohydrate: bread, potatoes, cereals, rice, pasta, porridge. **Carbohydrate** is broken down in the gut into glucose. Choose **granary, wholemeal flour and wholegrain cereals** as these release glucose slowly into the blood. They also have higher fibre content which improves digestion.

The carbohydrate portion on your plate should cover 33% of the plate.

VEGETABLES AND FRUITS

They are full of vitamins and minerals and some carbohydrate. **You should eat at least 5 pieces of different coloured fruit/vegetables a day.** A serving of vegetables is 2–3 tablespoonfuls or a bowl of salad; a portion of fruit is the size of a tennis ball or a handful of grapes. Potatoes are classed with the starchy foods so are not counted in this group.

The fruit and vegetable portion on your plate should cover 33% of the plate.

MILK, YOGHURT, CHEESE

This is a good source of calcium which is necessary for bone growth. Try and buy **low-fat products** such as skimmed milk and reduced fat cheese.

This group should cover 14% of your plate.

MEAT, FISH, POULTRY, EGGS, LEGUMES (BEANS) AND NUTS

These all provide protein. Choose **lean red meat or poultry without skin** to cut down on saturated fat. Eat **oily fish** (salmon, mackerel, sardines) at least twice a week as these help to reduce the risk of heart disease. Pulses and beans help keep glucose levels under control.

This group should cover 12% of your plate.

FOODS CONTAINING FATS AND/OR SUGAR

Choose **unsaturated fats** such as olive and rapeseed oil. Try diet drinks and sugar-free squashes. When looking at labels be aware that some low-fat products are high sugar and vice versa!

This group should cover only 8% of your plate.

- **Alcohol can be drunk in moderation** e.g. a maximum of 1-2 standard drinks units per day for women and 2-3 standard drinks units per day for men. It is advisable to spread these units across the week and to have 2-3 alcohol free days rather than drinking every day.
- **To calculate how many units** you are drinking multiply the volume you are drinking (in ml) by the % ABV* and then divide your answer by 1,000.
- **The maximum recommended weekly number of units for men is 21 and for women 14.**
- **See table** opposite to calculate how many units you are drinking a week.
- **Alcohol can cause hypoglycaemia** shortly after drinking and for 8-12 hours after drinking. So, if you want to drink alcohol, **check your blood glucose before you drink and eat** either before or while you drink. (Never drink on an empty stomach!) You should also check your blood glucose **before you go to bed** to make sure it is at a safe level. If your blood glucose is low, eat some carbohydrate to raise it.
- You do not want anyone to **confuse hypoglycaemia with drunkenness**, because they might not give you the proper assistance and treatment. The best way to get the help you need if you are hypoglycaemic is to **always wear or carry I.D. that states "I have diabetes."**
- **If you drink alcohol at least several times a week, make sure your doctor knows this before he/she prescribes tablets for your diabetes.**

*% ABV= Percentage Alcohol By Volume.

Some useful measurements of alcohol are:

1 unit	Half pint of normal beer (284ml) 4%	Single shot of spirits (25ml) 40%	Standard pub measure (50ml) of sherry or port 20%
1.5 units	Small glass of wine (125ml) 12.5%	Pub measure (35mls) of spirits 40%	Alcopops bottle (275ml) 5%
2 units	Half pint of strong beer (284ml) 6.5%	Large bottle/can of normal beer (440ml) 4.5%	Medium glass of wine (175ml) 12.5%
3 units	Large bottle/can of strong beer (440ml) 6.5%		Large glass of wine (250ml) 12.5%
9 units	Bottle of wine (750ml) 12.5%		
30 units	Bottle of spirits (750ml) 40%		

Percentages shown are of alcohol by volume (ABV).

- That all of the following are different names for sugar:
  - Dextrose
  - Maltose
  - Glucose
  - Sucrose
  - Fructose
  - Malt extract
  - Maltodextrins
  - Malt
  - Honey

- It is not just the type of sugar/starch/carbohydrate that you eat but more importantly the quantity of it that will affect your blood glucose levels.

- Often if something is low sugar, it is high fat (and vice versa) so it is important to always check the labels so that you can make informed healthy food choices!

Fasting is an important aspect of many religions, including Islam, Hinduism and Judaism as well as Christianity.

I have diabetes, can I fast?

Most people with health problems, such as diabetes, are exempt from fasting. Choosing to fast is a personal decision that you should make with advice from your diabetes team. **You must speak to your GP, diabetes nurse or diabetes doctor well in advance of fasting.**

If your diabetes is well controlled with diet or tablets and you do not have any complications of diabetes then you may be able to fast. If your diabetes team think your body will not cope well with fasting, or there are signs of damage due to high blood glucose levels, then they may recommend that you do not fast.

Fasting is not recommended in the following situations:

- If you have Type 1 diabetes
- If you use insulin injections more than two times a day
- If you use mixed insulin preparations, e.g. Novomix 30, Humulin M3
- If you have problems with frequent hypoglycaemia
- If you have had diabetic ketoacidosis [DKA] (dangerous levels of ketones and acids in the blood) within the past six months
- If you have had a hospital admission for very high blood glucose within the last six months
- If you have had severe hypoglycaemia (low blood glucose) in the past six months
- If you have hypoglycaemia but do not have any symptoms
- If you have poor control of your diabetes [HbA1c above 75 mmol/mol (9.0%)]
- If you have complications of diabetes, such as problems with your kidneys, heart or poor vision
- If you have an acute illness, including a diabetic foot infection or foot ulcer
- If you are pregnant

People with diabetes who fast are at risk of hypoglycaemia, hyperglycaemia and dehydration.

YOUR FAST MUST END IMMEDIATELY IF:

Your blood glucose falls to below 4.0 mmol/l at any time during the fast or rises above 16.0 mmol/l or if you become dehydrated.

If you decide to fast, here are some guidelines to keep you safe:

- Always carry glucose treatment with you
- Always have diabetes identification, such as a medical alert bracelet
- Test your blood regularly to monitor your glucose levels. This will not break your fast.
- Test your blood glucose level, if you feel unwell during the fast
- If your glucose level is high or low, **you MUST treat this**
- You should never stop your insulin, but **you MUST speak to your doctor** because you may need to change the dose and times of your insulin injections.

It is important to discuss any medication changes before you start fasting. If changes are not made you may be at risk of "hypoglycaemia" or 'hypos' (where your blood glucose levels fall to less than 4.0 mmol/l).

If you take any of the Sulphonylurea or Rapid Acting Insulin Secretogogue tablets in this list, you will be at increased risk of hypoglycaemia or a 'hypo'. Please speak to your Diabetes Team for tailored advice.

- Gliclazide
- Tolbutamide
- Glipizide
- Glibenclamide
- Glimepiride
- Nateglinide
- Repaglinide

You will need to adjust the times and dose of your medication during the fast if you take Metformin, Sulphonylureas, Rapid Acting Insulin Secretogogues or Insulin.

Hypos, high glucose levels and dehydration are all dangerous for people with diabetes.

Before you fast:

You do not have to eat double the day before you fast. In fact overeating before fasting can cause havoc with your blood glucose whilst you fast.

Eat more of foods that do not affect the blood glucose, such as protein and vegetables and only have moderate amounts of carbohydrates.

You should make sure that you **drink plenty of water to avoid dehydration.**

Over the day before fasting, drink at least 8-10 glasses of water.

Try eating whole grain sources of starchy carbohydrates, lentils and/or oats as these foods release energy slowly, which can help to maintain your blood glucose levels and make you feel less hungry.

After the fast:

Do not overdo the carbohydrates when breaking the fast. Eat light, low-carbohydrate foods; do not overeat and drink plenty of fluids.

Eating slowly also helps the glucose to be less erratic later.

- **Education courses for Type 2 diabetes in Hammersmith & Fulham, Kensington & Chelsea and Westminster.**
  Central Booking Office:
  Tel: 020 8962 4499
  email: cbo@nhs.net
- **Hammersmith & Fulham Diabetes Support Groups & Mentors**
  Peter Gilbert
  Tel: 020 7736 0044
  email: peterhgilbert@gmail.com
- **Expert Patient Programme: Frances Neate**
  Tel: 020 8964 2727
  email: frances.neate@raintrust.org.uk
- **Diabetes UK Care helpline**
  Tel: 0845 1202 960
- **Diabetes UK**
  www.diabetes.org.uk

For more information and to see the complete range of services available to you locally, visit:

www.knowdiabetes.org.uk

know diabetes
Live life to the full

Most of both parts of this handbook have been written by Dr Joanna Rees, a GP with a special interest in diabetes.

Parts of the Fasting & Diabetes section have been adapted from 'Ramadan and diabetes', with permission from the MCB and the authors Dr S.Ali and Dr S.Hussain and parts from the University Hospitals of Leicester guide.

Central London Community Healthcare NHS Trust provides community healthcare in the boroughs of Barnet, Hammersmith and Fulham, Kensington and Chelsea, and Westminster. We provide healthcare services to almost 1 million people across a range of locations including patients' homes, GP surgeries, walk-in centres and schools.

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For more information visit www.clch.nhs.uk or call 020 7798 1300.

This pilot is supported by a grant from SANOFI. March 2014.