My diabetes handbook

Name ……

Name ……

Address ……..……

……...

Phone ……..……

Date of birth ……

Date of diagnosis ……..……

Consultant(s) ……..……

Paediatric diabetes specialist nurse (PDSN)

……..……

Named nurse ……..……
Phone/bleep, **phone** 020 32991738

Dietitian ……
Phone/bleep, **phone** 020 3299 4434

Psychologist ……
Phone/bleep, **phone** 020 3299 2489

Paediatric diabetes coordinator,
phone 020 3299 2335

Out of hours, contact Guy's and St Thomas' switchboard, **phone** 020 7188 7188, and ask for the paediatric diabetes consultant on call.

Contents

What is diabetes?

The type of diabetes you have is called Type 1 diabetes. This type of diabetes is common in children.

Type 1 diabetes is caused by problems with the cells in your pancreas (an organ in your body) that make insulin. Insulin is a hormone that helps your body to absorb glucose (sugar) in your blood.

You will have had a blood test or a urine (wee) test which showed high blood glucose or ketone (a bi-product produced as a result of fat breakdown) levels. This is how we found out that you have Type 1 diabetes.

People with Type 1 diabetes need to:

- check their blood glucose levels at least 5 times a day
- have insulin injections every day
- eat a regular, healthy and balanced diet (like everybody else should)
- be active.

Having Type 1 diabetes means that you are more likely to have other medical conditions, so we might do more blood tests to check for problems like thyroid and coeliac disease.

Glucose, insulin and the body

The body needs glucose to work properly. The food we eat gets broken down into fat, protein and glucose in the stomach. The glucose then goes from the stomach to the small intestine (gut), where it enters the blood. When the glucose enters the bloodstream, the body releases a hormone called insulin. Insulin is produced by beta cells in the areas of the pancreas called Islets of Langerhans.

Insulin helps the glucose in the bloodstream to enter cells in your body where it is most useful. Each cell uses the glucose as fuel and this helps you to grow, play with your friends, go to school and stay healthy.

If there is not enough insulin to help the glucose to enter your cells, the amount of glucose in your blood will be too high and this can cause problems.

What happens in the body?

When you have Type 1 Diabetes, your pancreas does not produce enough insulin. This is because the cells that produce insulin have been badly damaged by an auto-immune process, and will eventually be destroyed.

Your stomach will still digest the food you eat, but there is not enough insulin to move all the glucose from your bloodstream into your cells.
This means that your body is unable to control the amount of glucose in your blood.

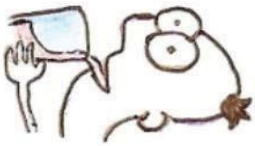
The cells do not get enough fuel to provide you with energy, and the amount of glucose in the blood rises to levels that cause symptoms, and are harmful to your body.

This is why you need to give yourself insulin - to help your body stay healthy and maintain your energy.

What are the symptoms of diabetes?

Before you were diagnosed with Type 1 diabetes, you might have noticed that you:

- were often thirsty and had a dry mouth
- needed to pass urine more often
- had lost weight
- felt tired
- had blurred vision.



Which symptoms did you have?

Your insulin injections should stop you from having these problems.

Type 2 diabetes

You might know someone with diabetes who does not have to inject insulin with every meal. This is because their pancreas still makes some insulin, but not always enough. Their body doesn't respond well to insulin, and can't use glucose from the blood, for energy. This is called insulin resistance.

They might control their diabetes by changing their lifestyle, eating healthily and by taking tablets. Some people with Type 2 diabetes need to take insulin, but this type of diabetes is different from Type 1 and is managed differently.

Why do I have diabetes?

Remember:

- it is not your fault or anybody else's fault that you have diabetes.
- anyone can have diabetes – even animals.
- diabetes is not caused by eating sweets or having sugary drinks.
- you may have been unwell with repeated viral infections (such as tummy bugs) over many years, and these may have triggered your diabetes.
- the risk of developing diabetes may have been passed on by your family, just like the colour of your eyes.
- you cannot catch diabetes from anybody, and you can't give it to anyone either.

Unfortunately, your diabetes will not go away. It will always be there. You will need to keep to treating your diabetes by injecting the insulin your body is unable to make.

Diabetes quiz
Have a go at filling in these missing words:

1 When we eat, we get a type of sugar called ……. from our food.

2 A hormone called ……. is produced by the beta cells in the Islets of Langerhans in the pancreas.

3 The ……. that produce insulin in your pancreas have been destroyed.

4 With Type 1 diabetes you need to inject ……. every day.

5 Type 1 diabetes is not caused by eating ……. or having sugary drinks.

Answers on page 68.

Healthy eating with diabetes

Healthy eating is important for everyone, if they have diabetes or not. Having diabetes does not mean you have to avoid sugar and sugary foods, but you will need to make sure you use your insulin injections as instructed. When you have a drink, it's best to have water or something sugar-free.

The Eatwell Guide on p12 shows the types and amounts of different food groups needed to make sure your diet is healthy and well-balanced. It does not apply to children under 2 years of age because they have different needs. Between the ages of 2 and 5, children should gradually start to eat the same foods and meals as the rest of the family. You should speak to your dietitian about your specific dietary needs.

Top tips for using the Eatwell Guide

You should choose a variety of foods from the green, yellow, blue and pink groups every day. Foods and drinks that are high in fat and sugar (purple group) should form the smallest part of your diet. Make sure you drink enough fluid, aim for 6 to 8 glasses each day.

Fruit and vegetables (green group)

Fruit and vegetables have lots of vitamins, minerals and fibre. These are important for keeping your body healthy. Try to eat at least 5 portions of fruit and vegetables each day. Try to include different types and colours.

Bread, rice, potatoes, pasta, yam, cereals and other starchy food (yellow group)
These foods should make up the main part of your diet. They provide energy to your growing body. Wholegrain bread, rice or pasta makes you feel fuller for longer, so choose these whenever you can. It can also stop high fluctuation (changes) in blood glucose levels, as they are broken down more slowly.

Milk and dairy foods (blue group)
Try to include foods from this group 2 to 3 times a day. These foods are a good source of calcium for strong and healthy bones.

Meat, fish, eggs, beans and other non-dairy sources of protein (pink group)
Include a small portion of these foods with your meals. Eat 2 portions of fish a week. 1 of these should be oily such as salmon, mackerel, trout, herring, fresh tuna, sardines and pilchards. Oily fish provides protection for your heart. Try to eat more beans and pulses.

Oils and spreads (purple group)
These foods should be eaten only in small amounts. The kind of fat that is found in foods like hard cheese, cakes, biscuits, sausages, cream, butter, lard and pies are not good for your health. Try to eat less of these, and change to foods that contain healthier fats, such as vegetable oils, oily fish and avocados.

Foods and drinks high in sugar

Eating too many sugary foods is not good for your health and can also cause you to be overweight. These foods are not required in a healthy diet. Sugary foods and drinks can also cause tooth decay, especially if eaten between meals. They may cause sudden peaks, and raise your blood glucose levels, making it hard for your insulin to bring down the blood glucose level. That is why we recommend drinking sugar-free drinks and water, and limiting how often you include high-sugar foods in your diet.

Eat less salt

Having too much salt in your diet can cause health problems such as high blood pressure. If salt is added during cooking, try to not add extra salt to your meal at the table. Processed foods like pastries, ready meals, ketchup and crisps, often have lots of added salt (and sugar), so try not to eat these too often.

Eatwell Guide

Use the Eatwell Guide to help you get a balance of healthier and more sustainable food. It shows how much of what you eat overall should come from each food group.

Check the label on packaged foods

Each serving (150g) contains

Energy	Fat	Saturates	Sugars	Salt
1046kJ 250kcal	3.0g	1.3g	34g	0.9g
	LOW	LOW	HIGH	MED
13%	4%	7%	38%	15%

of an adult's reference intake

Typical values (as sold) per 100g: 697kJ/ 167kcal

Choose foods lower in fat, salt and sugars

Eat at least 5 portions of a variety of fruit and vegetables every day

Fruit and vegetables

Raisins

Chopped tomatoes

Frozen peas

Choose wholegrain or higher fibre versions with less added fat, salt and sugar

Potatoes, bread, rice, pasta and other starchy carbohydrates

Potatoes

Whole grain cereal

Cous Cous

Porridge

Bagels

Whole wheat pasta

Rice

Spaghetti

Beans, pulses, fish, eggs, meat and other proteins

Lentils

Beans fewer salt and sugar

Tuna

Plain nuts

Chick peas

Lean mince

Eat more beans and pulses, 2 portions of sustainably sourced fish per week, one of which is oily. Eat less red and processed meat

Dairy and alternatives

Low fat soft cheese

Semi skimmed milk

Soya drink

Plain Low Fat Yoghurt

Choose lower fat and lower sugar options

Oil & spreads

Choose unsaturated oils and use in small amounts

Sauce

Crisps

Eat less often and in small amounts

6-8 a day

Water, lower fat milk, sugar-free drinks including tea and coffee all count.

Limit fruit juice and/or smoothies to a total of 150ml a day.

Per day 2000kcal 2500kcal = ALL FOOD + ALL DRINKS

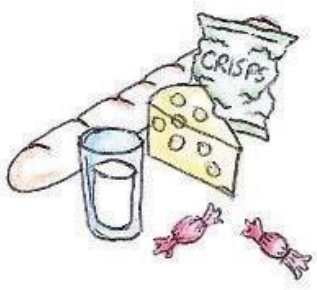
Source: Public Health England in association with the Welsh Government, Food Standards Scotland and the Food Standards Agency in Northern Ireland

What are carbohydrates (carbs or CHO)?

Carbs provide glucose that give the body energy. There are 2 main types of carb: starchy and sugary.

They are found in:

- starchy foods like potatoes, rice, pasta, bread, breakfast cereals, yam, sweet potato, chappati, injerra, noodles, couscous, porridge and crackers,
- Naturally occurring sugars in foods like milk, yoghurts and fruits
- Added sugar in foods like biscuits, cakes, chocolates, sweets



When you eat carbs, they are digested and turned into glucose. This glucose is absorbed into the bloodstream and taken to the cells that need energy. This happens with all starchy and sugary foods.

Your body uses this glucose for energy, but it needs insulin to use this glucose properly. The more carbs you eat, the more insulin you will need.

Your dietitian will teach you how to count your carbs and give yourself the right amount of insulin for the amount of carbs you're eating.

Fast-acting carbs
Some foods and drinks can raise your blood glucose level very quickly. Examples include sweets like jelly babies and chews, soft drinks and juices.

It is good to use these only when your blood glucose level is too low (if you have a hypo).

Slower-acting carbs
Most carb foods, especially wholemeal ones (for example, pasta, rice and bread) raise the blood glucose more slowly and work with your insulin to give you energy. Try to use wholegrain versions of carbohydrates as often as you can.

Keeping the balance

Most foods are a mixture of protein, fat and carbs. Everyone needs a good balance of each to make sure they stay healthy and grow. Talk to your dietitian about how much of each you need to stay healthy. You will be offered an annual appointment with the dietitian, where the balance of your diet can be discussed. You will also see your dietitian at your clinic appointments.

Diabetic food

Diabetic foods are not necessary and are not recommended. They are usually expensive and can cause tummy aches.

Celebrations and special occasions

Everyone loves a celebration on special occasions. There is no need for you to have a 'diabetic meal' - if you have an upcoming celebration, speak to the dietitian who can help you ‘carb count’ this food.

Sometimes, you might be so excited, that your blood glucose is likely to be high rather than low.

If you are going to be very active, for example dancing, playing football, doing athletics or swimming, your blood glucose may fall.

Follow the exercise guidelines later in this handbook and always carry some hypo treatment with you. You should do extra blood checks during these kinds of activities.

You may have to give yourself an extra dose of insulin if your blood glucose levels are running high.

Blood glucose monitoring/checking

Blood glucose monitoring is when you check your blood glucose levels with a blood glucose meter. It helps you to maintain glucose control and avoid high and low blood glucose levels. This way, you can do what you want in your daily life.

You should check your blood glucose at least 5 times a day, at the following times:

- when you wake up
- before you eat a meal and have your insulin
- 2 hours after meals
- before bed
- before and after exercise
- after changes in your insulin doses

You should increase checking if you are feeling unwell.

Please bring your blood glucose meter to each clinic visit.

Blood glucose checking devices

Blood glucose checking is important. Your diabetes nurse will help you to choose the best device for you.

Preparation

You will need:

- a monitoring device (blood glucose meter)
- a finger pricking device

Technique

- Wash your hands with warm water and dry them properly.
- Turn on your meter and follow the instructions.
- Prick the side of your finger and avoid your thumb and index (first) finger.
- Apply blood to the strip and wait for the result.
- Put the device away and dispose of the needle safely in your sharps bin.

Measures of control and glucose levels

Blood glucose checking is the most important part of having control over your blood glucose levels.

Blood glucose levels should be between:

- 4mmol/l and 7mmol/l during the day
- 5mmol/l and 7mmol/l before going to bed
- 5mmol/l and 9mmol/l 2 hours after a meal

There are other ways of measuring glucose levels, such as:

- continuous glucose monitoring (CGM) systems
- flash glucose monitoring systems

The team will discuss this with you while you are in hospital.

Haemoglobin A1c (HbA1c)

What is the HbA1c test?

This is the name given to the blood test that is done each time you come to the clinic. This test shows what your average blood glucose level has been over the last 2 to 3 months.

Inside your body, red blood cells are being made and destroyed all the time. Haemoglobin is the part of the red blood cells that carries oxygen from the lungs to the rest of the body. When you monitor your blood glucose, what is tested is the amount of glucose that sticks to the haemoglobin. This tells us your average blood glucose level during that blood cell's lifetime.

The ultimate aim is to achieve an HbA1c of 48mmol/mol (6.5%) or lower.

Good HbA1c levels will reduce the likelihood of future problems with diabetes, and will make you feel better too.

If your blood glucose levels are mostly high, your HbA1c will be high.

If you are having lots of hypos, your HbA1c may be lower than expected for someone with high blood glucose levels most other times.

Your HbA1c result is a long-term indicator but it is your daily blood glucose checks that give you valuable information. This will help make more precise changes to your insulin doses and improve your HbA1c.

The honeymoon period

Shortly after you were diagnosed with Type 1 diabetes, you will have started insulin therapy. During this time, there is often a period where the body restores the natural production of insulin in the beta islet cells. This means that blood glucose levels can improve to normal, or near-normal, levels and that you may have only needed very small amounts of insulin to achieve good blood glucose levels. This is known as the ‘honeymoon period'.

Sadly, the diabetes honeymoon doesn't last forever, but it may last for weeks, months, or occasionally years.

Blood glucose monitoring quiz

Answer true or false.

1. Blood glucose monitoring helps me to lead an active life. True / False

2. Blood glucose monitoring helps me to know if I am having a hypo. True / False

3. I should always wash my hands before using my blood checking device True / False

4. Blood glucose checking is not important. True / False

Answers on page 68

Insulin

By injecting insulin into your body, you are replacing what your body would have made.

This is usually achieved by giving 4 to 5 injections a day – this is called a basal bolus insulin regimen. This regimen also consists of taking 2 different insulins.

Your routine for taking your insulin will depend on your individual needs. With more injections you can be more flexible with what and when you eat, exercise and with your lifestyle in general.

Some people will have an insulin pump. This is another way of giving insulin.

Long-acting insulin (background or basal insulin)

This supplies a low level of insulin throughout the day and overnight. These insulins are designed to last a long time and will be given 1 or 2 times each day to keep a steady amount of insulin acting between meals and overnight.

There are different long-acting insulins currently available. These are called Degludec®, Levemir®, Lantus® and Toujeo®. These longer-acting insulins have no steep rise and fall, or peak in their action.

Fast-acting insulin (bolus)
Fast-acting insulins are designed to act quickly. They start working quickly and so are ideally injected 10 to 15 minutes before eating. Fast-acting insulin can also be given when your blood glucose level is high, to bring it back to your target. There are different fast-acting insulins currently available. These are called Novorapid®, Humalog®, Fiasp®, and Apidra®.

You should always follow the insulin routine that the doctor or diabetes nurse has prescribed for you. Sometimes, you and your parents may decide to change your dose depending on your blood glucose readings.

Using blood glucose results to change your insulin dose

Blood glucose checking, and recording or downloading the results, helps to control your diabetes. Recording or downloading your results might not be very exciting, but looking at patterns of glucose results can be helpful.

Seeing how they improve with changes in your diet, exercise levels and insulin routine, makes caring for your diabetes much easier and better. You can always talk to your diabetes team about this.

Storage of insulin

Your insulin will need to be stored in the non-freezing area of the refrigerator. It is a good idea to keep a container just for your insulin. All insulin will have an expiry date on it and it is important to check this regularly. It is good practice to keep a note of the starting date of each insulin cartridge in your diary. We recommend that you change to a new insulin cartridge every 28 days, even if the old one has not been fully used. The insulin pen should be stored at room temperature and not in the fridge.

Injections - Why? When? Who? How? Where?

Why do I need injections?

You need to have injections because your body cannot make its own insulin, which you need to be able to grow properly and to have energy for everything you do.

When will I have them?

You will need 4 or more injections every day.

Who will inject me?

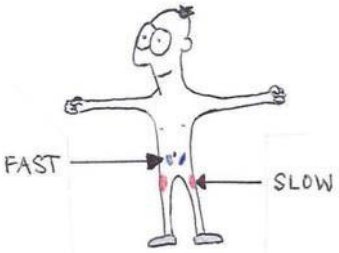
You, your parents and any carers will all learn how to give your injections. If you are looked after by anybody else, they may need to learn as well.

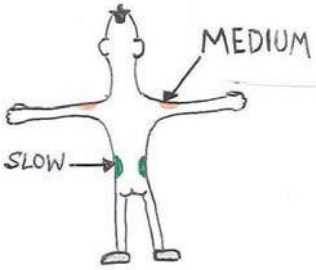
How will I inject my insulin?
You will inject your insulin by using an insulin pen.

Where should I inject myself?
Good places to inject are the thighs, tummy (abdomen), bottom (buttocks) and arms.

It is important that when you inject yourself, you do not do it in the same place all the time. There are different places you can use and each will absorb insulin at a different rate. This means that where you give your insulin has an effect on how quickly it will work.

- Thighs - upper, outer parts of the thighs. Slower absorption so a good place for your background (slow-acting/long-acting) injection.
- Arm - upper and outer parts of the arm. Medium to fast absorption.
- Tummy - either side of the belly button or side of the waist. Fast absorption.
- Bottom - upper external parts. Slow absorption.





Injection site rotation

It is important to change the place that you inject your insulin. If you don't then you can get lumpy areas. This happens because the insulin causes extra fat to be stored in the fat cells. If this happens and you keep using that site, then your blood glucose levels may become erratic because the insulin cannot be absorbed properly.

The insulin pen

In order to work, the insulin pen needs to be loaded with a cartridge of insulin. You will be shown how to:

- load the pen with an insulin cartridge
- do an 'air shot' to make sure that insulin is coming out
- dial up the units you need
- inject the insulin into your body

When you inject yourself it is important that you inject into fat and not muscle, so that the insulin gets absorbed at the right speed. So, do not pinch when using a 4mm or 5mm pen needle.

Remember not to inject the same place every time.

It is important that you count to at least 10 before taking the needle out from under your skin. This is to make sure that the insulin does not leak back out.

Needle size, usage and disposal
There are different sizes of pen needles. We usually recommend 4mm or 5mm needles. Your diabetes nurse specialist will teach you the correct injection technique. At school, if you do not inject yourself, the staff will use a special safety needle, called an AutoShield™ needle.

You must always dispose of used pen needles safely by placing them into a sharps bin.

When your sharps bin is full you can ring up your local council so that they can collect the full bin and replace it with an empty one. This might vary in different areas. If you prefer, you can take the full bin to your GP (doctor) and exchange it for an empty sharps bin.

Injection technique

1 Make sure it is the correct insulin and check the expiry date.

2 Attach needle.

3 Remove needle cap.

4 Remove needle protector.

5 Dial up 2 units.

6 ‘Air shot’.

7 Dial up dose to give.

8 Select injection site and insert needle.

9 Push plunger down and count to 10 seconds.

10 Option to clip needle off using BD Safe-Clip™.

11 Dispose of needle into sharps box.

Insulin quiz

1. Which area of the body absorbs insulin fastest?
    a. Tummy
    b. Thigh
    c. Arm

2. What happens if you inject insulin in the same place all the time?
    a. It gets lumpy
    b. It's okay

3. How would you dispose of your sharps (pen needle and lancets) safely?
    a. In a sharps bin
    b. In the kitchen bin

Answers on page 68

Hypoglycaemia (low blood glucose)

Your body is similar to a car. If a car runs out of fuel it will stop working. This is what happens when you run out of glucose.

Glucose is the fuel that makes our bodies work. If our glucose levels become low, our bodies do not work very well and we may start to feel poorly. Having low blood glucose levels is called hypoglycaemia.

Hypoglycaemia occurs when your blood glucose drops below 4mmol/l. Some people call this ‘having a hypo’.

What causes a hypo?

Lots of things can cause a hypo, including:

- not eating enough food
- missing meals and snacks
- doing exercise without extra snacks
- too much insulin
- illness (usually a tummy bug)
- hot weather (which causes insulin to be absorbed more quickly)

How do you feel when you have a hypo?
Having a hypo affects people very differently. Your body needs to warn you that your blood glucose level is getting low so it might make you feel:

- hungry
- cold
- sick
- weak
- angry
- hot
- sweaty
- shaky

Everybody will have their own symptoms when their blood glucose is low.

Write in the box below how you feel when you have a hypo:

How to treat a hypo
The earlier you recognise the signs of a hypo, the easier it is to treat. Most people will know their own set of signs and so will only have a mild hypo.

When you have a hypo it is very important to check your blood glucose level immediately and then have something sugary to eat or drink straight away. A blood glucose check is necessary because the symptoms of a hypo can be similar to the symptoms of having hyperglycaemia (high blood glucose levels).

Here's what to do if you think you are having a hypo:

1. Stop what you are doing.
2. Tell someone how you feel.
3. Check your blood glucose level to make sure it is a hypo.
4. Eat or drink something sugary: everybody needs a different amount depending on their age and size.

Something sweet, something starchy

You should carry glucose tablets or a sugary drink and 8g of a starchy carbohydrate-containing snack (such as a digestive biscuit) with you at all times. This way, a hypo can always be treated, whether you're at home, at school or out.

At school, make sure there is a labelled container which contains suitable hypo treatment, and possibly a spare blood glucose meter.

Hypos in pre-school-age children

Box 1

Follow this box if child is cooperative and able to swallow safely.

Give 5g of fast-acting carbohydrate (CHO) such as:

- 2 glucose tablets or Dextro tablets
- 50ml sugary drinks (not diet) such as cola or pure fruit juice
- 2 fruit pastilles
- 1 jelly baby
- Lift Glucojuice – 1/3 bottle
- Lucozade original 60mls

Box 2

Follow this box if child refuses to drink, is uncooperative, but is conscious.

Give oral glucose gel (Glucogel® or Dextrogel® – formally known as Hypostop).

This is a fast-acting sugary gel, in an easy-twist-top tube.

Use 1/2 a tube.

Squirt tube contents in the side of each cheek evenly and massage gently from outside enabling glucose to be swallowed and absorbed quickly

Do NOT use oral glucose gel in an unconscious or fitting child.

After 15 minutes re-check blood glucose:
If still low (<4 mmol/l) and able to take oral fluids repeat Box 1 (once).

If still low (<4 mmol/l), refuses to take oral but is conscious, follow Box 2 (once).

If blood glucose 4mmol/l or greater, proceed to **Box 3**.

Hypos in pre-school-age children

continued

Box 3

If feeling better and blood glucose level >4.0mmol/l, give 8g slow-acting carbohydrate snack (or normal meal if it is mealtime) such as:

- ½ slice of toast
- 1 piece of fresh fruit
- 1 plain digestive or Hobnob© biscuit
- glass of milk (180ml)

(Patients on insulin pumps: Please refer to paediatric protocol for insulin pump therapy guideline.)

If hypo is just before a mealtime (when insulin is usually given) the hypo should be treated first, and once the blood glucose is >4.0 mmol/l the insulin should be given as usual. **Do not omit insulin**, especially important with an early morning hypo.

Review history of hypo: If possible, the cause should be identified and if necessary the insulin dose adjusted, for example, for early morning and night-time hypos, ask about extra exercise the evening before and details of bedtime snack.

Hypos in primary school-age children

Box 1

Follow this box if child is co-operative and able to swallow safely.

Give 10g of fast-acting carbohydrate (CHO) such as:

- 3 to 4 glucose tablets or Dextro tablets
- 100ml sugary drinks (not diet) such as cola or pure fruit juice
- 3 fruit pastilles
- 2 jelly babies
- Lift Glucojuice – half bottle
- Lucozade original 115mls

Box 2

Follow this box if child refuses to drink, is uncooperative, but is conscious.

Give oral glucose gel (Glucogel® or Dextrogel® - formally known as Hypostop).

This is a fast-acting sugary gel, in an easy-twist-top tube.

Use 1 tube.

Squirt tube contents in the side of each cheek evenly and massage gently from outside enabling glucose to be swallowed and absorbed quickly.

Do NOT use oral glucose gel in an unconscious or fitting child.

After 15 minutes re-check blood glucose:
If still low (<4 mmol/l) and able to take oral fluids repeat Box 1 (once).

If still low (<4 mmol/l), refuses to take oral but is conscious, follow Box 2 (once).

If blood glucose 4mmol/l or greater, proceed to **Box 3**.

Hypos in primary school-age children

continued

Box 3

If feeling better and blood glucose level >4.0mmol/l, give 8g slow-acting carbohydrate snack (or normal meal if it is mealtime) such as:

- ½ slice of toast
- 1 piece of fresh fruit
- 1 plain digestive or Hobnob© biscuit
- glass of milk (180ml)

(Patients on insulin pumps: Please refer to paediatric protocol for insulin pump therapy guideline.)

If hypo is just before a mealtime (when insulin is usually given) the hypo should be treated first, and once the blood glucose is >4.0 mmol/l the insulin should be given as usual. **Do not omit insulin**, especially important with an early morning hypo.

Review history of hypo: If possible, the cause should be identified and if necessary the insulin dose adjusted, for example, for early morning and night-time hypos, ask about extra exercise the evening before and details of bedtime snack.

Hypos in secondary school-age children

Box 1

Follow this box if child is cooperative and able to swallow safely.

Give 15g of fast acting carbohydrate (CHO) such as:

- 5 glucose tablets or Dextro tablets
- 150ml sugary drinks (not diet) such as cola or pure fruit juice
- 5 fruit pastilles
- 3 jelly babies
- Lift Glucojuice® – 1 bottle
- Lucozade original 170mls

Box 2

Follow this box if child refuses to drink, is uncooperative, but is conscious.

Give oral glucose gel (Glucogel® or Dextrogel® – formally known as Hypostop).

This is a fast-acting sugary gel, in an easy-twist-top tube.

Use 1½ a tubes.

Squirt tube contents in the side of each cheek evenly and massage gently from outside enabling glucose to be swallowed and absorbed quickly.

Do NOT use oral glucose gel in an unconscious or fitting child.

After 15 minutes re-check blood glucose:
If still low (<4 mmol/l) and able to take oral fluids, repeat Box 1 (once).

If still low (<4 mmol/l), refuses to take oral but is conscious, follow Box 2 (once).

If blood glucose 4mmol/l or greater, proceed to **Box 3**.

Hypos in secondary school-age children

continued

Box 3

If feeling better and blood glucose level >4.0mmol/l, give 8g slow-acting carbohydrate snack (or normal meal if it is mealtime) such as:

- ½ slice of toast
- 1 piece of fresh fruit
- 1 plain digestive or Hobnob© biscuit
- glass of milk (180ml)

(Patients on insulin pumps: Please refer to paediatric protocol for insulin pump therapy guideline.)

If hypo is just before a mealtime (when insulin is usually given) the hypo should be treated first, and once the blood glucose is >4.0 mmol/l the insulin should be given as usual. **Do not omit insulin**, especially important with an early morning hypo.

Review history of hypo: If possible, the cause should be identified and if necessary the insulin dose adjusted, for example, for early morning and night-time hypos, ask about extra exercise the evening before and details of bedtime snack.

Sometimes, a severe hypo can make you very sleepy and even unconscious. If this happens, you have to be put into the recovery position and given a special injection called glucagon.

Glucagon is a hormone that increases your blood glucose by releasing stored glucose from your liver.

When you have been very active during the day, you may need an extra snack before going to bed. If the exercise is very energetic, don't forget to have another snack after you have finished.

Remember: Your blood glucose can fall a few hours after the exercise so it is sometimes necessary to reduce the overnight insulin dose, especially if the exercise has been very energetic. It might be necessary to check your blood glucose level more frequently, if your blood glucose level is less than 7mmol/l before exercise, take a small snack of about 10g carbohydrate content.

Things to remember

- Make sure you carry glucose tablets, sweets or a sugary drink, and an 8g to 10g carbohydrate containing snack with you at all times.
- Tell your teacher and friends what they can do to help you if you have a hypo.
- Always check your blood glucose level before and after exercise and have a snack if necessary.
- Tell someone if you feel unwell or not quite right.
- Wear a medic alert bracelet or necklace, and carry a diabetic ID card so that people know how to help you if you're in trouble.

Hyperglycaemia

Hyperglycaemia is the opposite of hypoglycaemia. This is when you have too much glucose in your blood.

Your blood glucose readings might be in double figures and this may be because the insulin you are taking is not enough for what your body needs to do.

It is often upsetting to find that your blood glucose levels are above the normal range of 4mmol/l to 7mmol/l, especially when you feel you have done everything right.

We aim for a blood glucose of 4mmol/l to 7mmol/l because this is the blood glucose range of someone who doesn't have diabetes. It's often really hard to achieve, even if you are working really hard and checking a lot. Don't feel upset. It's a hard condition to manage. There are lots of factors to take into consideration and nobody can get it right all the time. Just take the action needed for the blood glucose reading that you see, and check again a bit later.

Remember: There are many things that can make your blood glucose rise.

You may:

- have missed an insulin injection
- be ill
- have been unable to accurately work out the carbohydrate you have eaten
- have grown and the insulin requirements might have gone up
- have an emotional reason, such as stress or excitement

Sometimes there is no obvious reason at all for your high blood glucose levels.

If your blood glucose levels are too high, your diabetes team will suggest you give what is called a correction dose of insulin. This will help to ‘correct’ your blood glucose and bring it down to the target level.

When your blood glucose level is high your body is using fat, instead of glucose, to get its energy. When fat is broken down in the body it produces waste products called ketones. These ketones can make you very unwell.

When there is too much glucose and too many ketones in your blood you may:

- feel thirsty
- need to pass urine more often
- feel weak and tired
- have a tummy ache
- feel sick or have been sick
- breathe more deeply
- have blurred vision

It is important that you check your blood or urine for ketones when your blood glucose level is above 14mmol/l, and take action as advised.

Checking for ketones

You will have been given a blood ketone meter and some strips by your team. You can use these to check your blood (for example, Freestyle Optium Neo or Glucomen®) and see if you are producing too many ketones.

If your ketones continue to rise they act like a poison. This can make you feel sick and you may find it difficult to keep liquids down, making you dehydrated. Your skin may become dry, your eyesight blurred and you may find that you are breathing faster.

For more information on how to get rid of these ketones, please read the ‘Sick day rules’ section of this book.

Blood ketone level	What you should do
Below 0.6mmol/l	This is within normal limits for ketones.
Between 0.6mmol/l and 1.5mmol/l	Follow advice on blood glucose app or meter, and re-check blood glucose and ketones every 2 hours**.** **phone** 020 3299 1738, or out of hours, **phone** 020 7188 7188 for advice. Encourage ……. to rest and drink water. **Add 10% of the total daily dose (units) to your insulin correction dose.** Re-check blood glucose and ketone levels in 2 hours, and drink sugar-free fluids, at least 100ml each hour.
Above 1.5mmol/l **If you are vomiting or feeling unwell go to the nearest emergency department (A&E)**	Follow advice on blood glucose app or meter, and re-check blood glucose and ketones every 2 hours. You **must** contact your diabetes team for advice, **phone** 020 3299 1738, or out of hours, **phone** or 020 7188 7188. Encourage ……. to rest and drink water. **Add 20% of the total daily dose (units) to your insulin correction dose.** Re-check blood glucose and ketone levels in 2 hours, and drink sugar-free fluids, at least 100ml each hour.

Test for ketones when you are not feeling well, or when your blood glucose is higher than 14mmol/l, 2 times in 1 day.

Sick day rules

Feeling unwell?

You may wake up feeling unwell with the latest bug or virus. Having diabetes does not mean you are more likely to become unwell, but being ill can affect your diabetes control.

Being unwell can cause your blood glucose levels to be high or low.

Blood glucose levels may be low if you have diarrhoea or vomiting, or when not enough food is being absorbed or eaten. This may mean that you need less insulin, but you should never stop taking your insulin without advice from a medical professional. Speak to your diabetes team for advice.

Blood glucose levels can often rise with a fever or with infections, such as tonsillitis or an ear infection. In this case you will need more insulin.

When you are unwell, you will need to check your blood glucose levels more often. You can use the flowcharts on pages 47 and 49 as a guide.

Ketones are produced when you have high glucose levels and are feeling unwell. Ketones are acidic chemicals which can cause diabetic ketoacidosis (DKA). If left untreated, ketoacidosis can make you very ill and you may need to be admitted to hospital.

If you are not able to eat or drink anything, if you have high glucose levels with ketones, or if you feel worried, ask your parents/carer to ring the paediatric diabetes team or the out-of-hours service as soon as possible.

If you are sick due to high ketone levels, you must go straight to the Emergency Department.

Some rules for when you are feeling unwell

1 Do not stop using your insulin.
2 Check your blood glucose levels every 2 to 4 hours. Aim for blood glucose levels of 8mmol/l or lower.
3 In some cases, you may need to adjust your normal insulin dose. Your diabetes team can help you with this, and you can use the flowchart on pages 47 and 49 as a guide.
4 If your blood glucose level is in or above target range, drink plenty of sugar-free drinks.
5 If your blood glucose level is less than 5mmol/l, consider taking sips of sugary drinks like lemonade or cola.
6 If you have a fever (high temperature), you may need to take sugar-free paracetamol or other suitable treatment. Always follow the instructions on the pack and read the label.
7 Make sure you get lots of rest.
8 Some medicines contain sugar, so ask your pharmacist for sugar-free medicine.
9 See your doctor (GP) if you are worried or if you are not getting any better.

10 If you are not sure what to do outside working hours (after 5pm or at weekends and bank holidays, you can call the out-of-hours paediatric diabetes doctor for help.

Common symptoms of diabetic ketoacidosis (DKA):

- ketones are present and are higher than 0.6mmol/l in blood
- going to the toilet (peeing) more frequently
- vomiting (being sick)
- drowsiness
- deep, heavy breathing (Kussmaul breathing)
- breath smells of pear drops or nail varnish remover (this is the smell of ketones)

If you notice any of the above symptoms, seek urgent advice from your paediatric diabetes team, or out-of-hours service, or go to your closest emergency department, as hospital treatment might be necessary.

If you are vomiting go to your nearest emergency department immediately to help you get better.

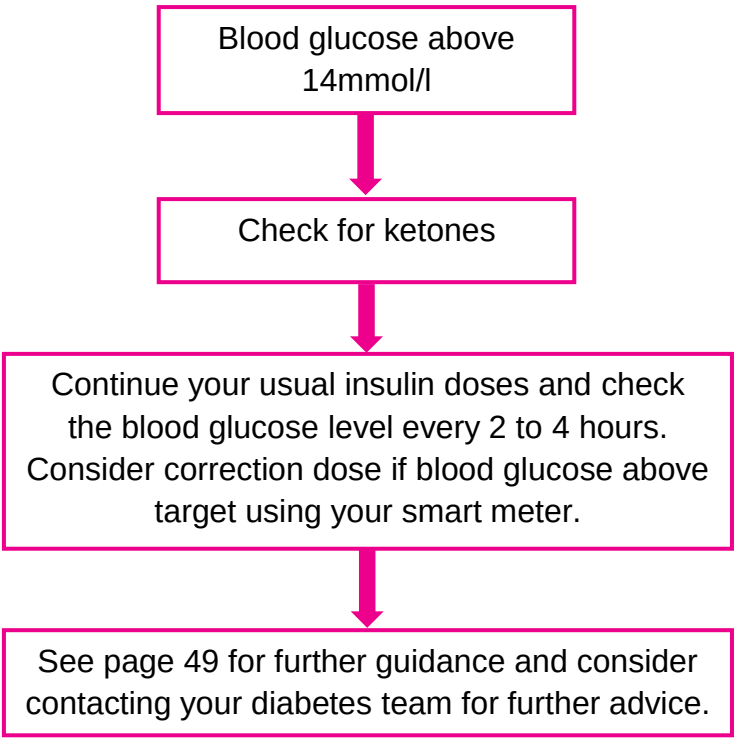
Useful contact numbers for advice

Diabetes team (nurse specialist and consultant), **phone** 020 3299 2335, Monday to Friday, 9am to 5pm.

Paediatric diabetes nursing team, **phone** 020 3299 1738.

Outside of office hours and at weekends, **phone** 020 7188 7188, and ask the operator for the on-call paediatric diabetes doctor.

Correction guidelines



Guidance on managing while you're unwell

- Go to the emergency department if you cannot stop vomiting, or feel too ill to manage your diabetes yourself.
- Even if you are vomiting, do not stop checking your blood glucose levels and taking your insulin.
- During illness it is very likely that you will need to take more insulin. Consider increasing your basal insulin (long-acting insulin) by 10%.
- Checking your blood for ketones will help you work out how much extra insulin you need.
- Get into the habit of checking for ketones if you think that you may be ill or if you have high blood glucose levels (above 14mmol/l).
- Check your blood for ketones and your blood glucose levels every 2 hours when ill.
- Drink at least half a cup of sugar-free fluid every hour.
- Seek advice to find out the underlying reason for the illness.

How to calculate your correction dose

Count the total number of insulin units (fast-acting and long-acting) taken regularly on a normal day. Divide this by 10 (for 10%) or 5 (for 20%) as advised by the flow chart on page 49. Inject this figure as fast-acting insulin (Novarapid, Humalog, Fiasp, or Apidra). On your app or pump it can advise you on how much correction to give.

What to do when your blood glucose (BG) level is high

BG above 14mmol/l or when unwell

↓

Check for ketones

↓

Above 0.6mmol/l in the blood

↓

Add up total number of insulin units (fast- and long-acting) taken regularly on a normal day. Divide this by 5 (for 20% extra) and inject this figure as fast-acting insulin now.

↓

Check BG/ketones every 2 hours

↓

BG over 10mmol/l

↓

Give the same amount of insulin as previously worked out or follow advice of your app.

Less than 0.6mmol/l in the blood

↓

Continue your usual insulin regimen and check the BG every 2 to 4 hours and consider correction dose if BG is above target.

Note: If your blood glucose meter reads **'HI'** mmol/l, it means your blood glucose levels are above 27mmol and you will need to take extra rapid-acting insulin. Divide your daily dose by 5 and take as rapid-acting insulin (Novarapid, Humalog, Fiasp, or Apidra) now.
Re-check in 2 hours and take appropriate action.

NOTE: Extra doses of insulin can be given every 2 hours until the blood glucose level falls below 14mmol/l and ketone levels come down. Please contact your diabetes team for more advice.

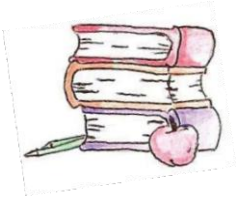
Going to school

As you will spend a large amount of your time at school, it is important that your teacher, teaching assistant, first aid person, and any other key staff know about your diabetes. They need to know how to deal with any problems that might occur when you are at school.

Your school can contact your paediatric diabetes nurse at any time. The nurse can then talk to the staff, and even the children, if you would like them to. Regular school staff study days are held throughout the year to provide training on diabetes for members of the school.

You should put all of your equipment in a labelled container and keep it in a safe place at school. Ask your teacher where would be the safest place to keep it. The container should have the following in it:

- glucose tablets (or something similar)
- biscuits or any starchy snack
- a blood/ketone glucose meter and your insulin pen
- glucose gel



You should keep an extra cartridge/vial of insulin in the school fridge, and also a spare insulin pen. This is in case the cartridge of insulin is not working or is broken. Schools should provide you with a safe and private place for you to inject yourself, for example the first aid room.

It's important to eat either a packed lunch or school dinner after having your lunchtime insulin.

There is no reason for you to miss any school outings or trips. Your paediatric diabetes team can help if you have any worries.

Do not be afraid to tell a teacher or lunchtime supervisor if you feel a hypo coming on. Tell your friends about your diabetes and explain to them how they can help you if you feel unwell.

Be prepared if you are going to be more active, for example, if you are swimming, playing sports, or running more than you normally do. You may need to have an extra snack or reduce your insulin as advised.

Exercise

Exercise is good for you. It makes you feel good, keeps your heart healthy, improves your blood glucose levels, and also improves the efficiency of insulin.

Every young person (with diabetes or not) should be aiming for a minimum of 60 minutes activity each day. Blood glucose levels should be checked before exercise, and it is important to consider what type of activity is being done.

Aerobic activities, like football, hockey or cross-country running) are generally longer in duration and lower in intensity, and are likely to decrease blood glucose levels.

Anaerobic activates, like sprinting or gymnastics, are generally shorter duration and high intensity, and have less-immediate impact on blood glucose levels.

Blood glucose level	**Action**
Below 5mmol/l	*8g to 10g carbohydrate before starting any exercise. Do not exercise until blood glucose levels are above 5mmol/l and rising.
5mmol/l to 6.9mmol/l	*8g to 10g carbohydrate before aerobic exercise, anaerobic exercise can be started.
7mmo./l to 10mmol/l	Extra carbohydrate is not required before starting exercise. If prolonged (greater than 45 minutes) exercise, blood glucose levels should be checked half-way through, and a snack given if blood glucose levels are below 7mmol/l.

10.1mmol/l to 14mmol/l	Do not give correction dose recommended. Extra carbohydrate is not needed before starting exercise. If prolonged (greater than 45 minutes) exercise, blood glucose levels should be checked half-way through, and a snack given if blood glucose levels are below 7mmol/l
Over 14mmol/l	If high blood glucose is unexplained, blood ketones should be checked. If ketone levels more than 0.6mmol/l, follow advice in the hyperglycaemia section. Exercise should not be started until blood ketone levels are below 0.5mmol/l.

*Examples of an 8g to 10g of carbohydrate are:

- 1 plain biscuit
- a small apple
- a small glass of milk
- a small box of raisins
- 2 dried apricots

Glucose levels should be checked immediately after exercise. Consider an 8g carbohydrate snack if glucose levels are below 7mmol/l. More intense exercise might make a snack more likely to be needed. When wearing a Libre or CGM, downward arrows mean a snack is more likely to be required.

School and exercise

Before doing extra exercise or activities, you should speak to your diabetes team for individual advice.

You might want to consider reducing the amount of insulin for your meal injection just before or after exercising. Your diabetes team can advise you on this.

Always carry some appropriate hypo treatment with you.

Make sure you check your blood glucose levels regularly, especially before and after exercise. This allows you to understand what your body needs (food/insulin).

Remember: Your blood glucose can fall a few hours after the exercise, so it is sometimes necessary to reduce the overnight insulin dose, especially if the exercise has been very energetic.

Going on holiday

Diabetes should not stop you from going on holiday, but being away from home may mean you need to take extra care of your diabetes.

Ask your parents/carers to:

- speak to your diabetes nurse specialist at least 4 to 6 weeks before you go away, to discuss how to manage your diabetes during your holiday, and get a travel letter (for customs/security).
- check with your GP whether you will need any vaccinations before you travel.
- make sure that you have a double supply of everything you need (insulin, pens, and other equipment). You should carry these in 2 separate sets of hand luggage in case 1 gets lost. Don't forget spare batteries or chargers for the meter or pump.
- Make sure you have a copy of your latest clinic letter with you for your latest settings of your app or pump, in case of loss or theft.
- learn a phrase in the country's national language that will allow you to get help if you need it.
- contact the Diabetes UK Careline, **phone** 0845 120 2960, for a free fact sheet for people with diabetes going on holiday.
- check the Diabetes UK website for tips.
- make sure that you have told your holiday insurance company that you have diabetes.

Travel sickness
Consider having smaller meals. Do not drink too many fizzy, or diet drinks. Your local chemist will be able to offer advice on suitable travel sickness medicine.

Global Health Insurance Card (GHIC)
A UK GHIC and new UK EHIC are free of charge. Beware of unofficial websites, they may charge you a fee to apply.

You should still get your own separate travel insurance, as not all types of medical care are covered by the GHIC. For example, the card does not cover emergency repatriation (flying you back to your home country) and not all countries give the same level of cover as the NHS.

Travel insurance
All people travelling abroad are advised to have their own travel insurance. Diabetes UK can help you to find an appropriate insurance company.

People with diabetes should:

- buy travel insurance earlier than usual.
- never buy insurance based only on price - always check what is covered and read the small print.
- make sure your insurance does not exclude pre-existing conditions, such as diabetes.
- be honest about all of your medical conditions - hiding details could lead to problems if you need to make a claim

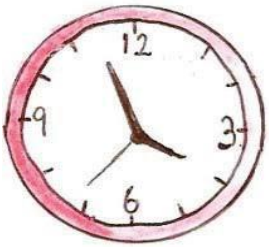
If you have any problems getting holiday insurance, contact Diabetes UK, who provide their own insurance service.

Airport security

Remember, you cannot take containers of more than 100ml liquid through security at some airports, so you may want to take glucose tablets with you.

Time zones

When you are travelling, there may be a time difference between other countries and the UK. Before you travel, speak to your diabetes team for advice on how to manage your insulin injections.



Identification
It is important that you wear a medic alert necklace or bracelet, or carry some form of diabetes identification with you in case you are ill. You can buy these online.

You should also remember to take your diabetes identification card. This gives the name and phone number of your doctor and also offers advice on what to do if you feel ill.

ID CARD STUCK HERE

Insulin, pens, meters and equipment
When going abroad, carry 2 sets of your insulin, insulin pen, meter, glucagon and other equipment in your hand luggage so that you have a spare if 1 set goes missing. If you are going on a plane, remember that insulin cartridges and glucagon should not go into the main luggage compartment (hold) as it may freeze and become inactive (stop working).

Remember to pack your insulin stores in cool bags. If you are driving, **do not** put the insulin, pen needles, glucagon, meter and test strips in the boot or glove compartments, because the supply can be damaged when exposed to hot or cold temperatures.

You should make sure that you take enough insulin for the length of your holiday. You should also contact your insulin manufacturer before you travel and find out what your insulin is called in the country you are travelling to. This way, if you run out or lose your insulin, you can try to get some more.

When you get to your holiday destination, you should examine any clear insulin for crystals.

> You must throw the insulin away if crystals are found, as this might cause the insulin to be inactive.

Even if the insulin looks okay, check your blood glucose levels more frequently as things might change while you are abroad.

Diet and food when travelling

You never know if your flight is going to be delayed or if meals will be late on the plane, so you may want to carry extra snacks with you, and don't forget your water or diet drinks.

There is no need to order a diabetic meal from the airline.

Make sure you check your blood glucose levels more frequently when travelling and make sure you carry your hypo treatment with you at all times.

Activities
Being on holiday means that you will probably change your activity levels.

Here are some tips:

- Exercise is good for you, so continue with your usual levels of activity as much as possible.
- Always carry some form of hypo treatment with you.
- Make sure you tell whoever is supervising your activities that you have diabetes.
- When you are off doing activities, tell your parents or carers where you are at all times.
- A change in the weather may change your activity levels. For example, in hot weather some people want to swim all day (and so need extra carbohydrate/less insulin), while others may want to sunbathe. To find out the effects of different activities on your diabetes, check your blood glucose regularly.
- Make sure you wear comfortable shoes, especially when walking or doing activities. For more information about caring for your feet, please see page 63.

Travel checklist - what to pack

- 2 separate supplies of insulin
- 2 separate supplies of needles and pens
- Diabetes identification
- 2 blood glucose meters and spare batteries as well as the ketone meter
- 2 finger prickers
- 2 separate supplies of lancets and test strips
- Hypo treatment
- Extra snacks
- A letter from your diabetes team, and your last clinic letter, to show at customs or to airport security

Holiday quiz

1. What should you carry with you at all times?
    a. Hypo treatment
    b. Insulin
    c. Needles

2. Name 2 things you should do when you have a hypo (low blood glucose)?
    a. Have a sugary drink
    b. Have a dietp drink
    c. Check your blood glucose
3. How do you store insulin when travelling?
    a. In the hold
    b. In the hand luggage

Answers page 68

Complications

Diabetes can cause long-term problems if blood glucose levels are consistently out of target over a prolonged period of time, this can make you more susceptible to complications with your:

- eyes
- kidneys
- circulation
- legs and feet
- nerves
- heart

Treating diabetes helps to keep blood glucose levels normal and prevent long-term complications.

Your clinic will plan regular checks for these possible health problems. However, complications are less likely if you control your diabetes well. For the best control, you should aim for the lowest achievable HbA1c - at least below 48mmol/mol/6.5%

Your eyes

If you are over 12 years old, or have had diabetes for 5 or more years, you will have the back of your eyes checked once a year at the ophthalmologist or Diabetic eye complication screening service. This is called retinal screening or DECS.

Some people experience blurred vision when they first start using insulin or when their blood glucose levels are high. This will almost always go away.

Your teeth
Poor diabetes control can lead to gum disease. Brush your teeth regularly and carefully. Have regular check-ups with your dentist, and make sure your parents or carers let your dentist know that you have diabetes and that you use insulin.

Your feet
It is important for you to look after your feet so that they stay in good condition. Here are some tips on how to take good care of them:

- Make sure that your shoes/trainers fit well.
- Wash your feet regularly and dry them carefully, especially between the toes.
- Cut toenails following the nail bed shape.
- Check your feet regularly for blisters, sore areas, broken skin and verrucas. See a podiatrist (foot doctor) if you have any problems.
- Do not walk around outside without shoes on. Always wear sandals on the beach.
- If you have any blisters, sore areas or cuts, keep the area clean and dry, and consider using a plaster or dressing.

If there is anything you are unsure about, talk to your diabetes team. You should expect to have a check-up every year.

How you might feel?

When you are first told that you have diabetes, you and your family might feel a mix of emotions. You might feel shocked, in denial, angry, sad, guilty, or other emotions.

These feelings can happen at other times after diagnosis too. For example, you might feel frustrated or get annoyed with living with diabetes all the time.

All of these feelings are very normal and they can go away by themselves, but sometimes they can get in the way of getting on with your life. If you think this is happening to you, please speak to the diabetes team as they can help.

There is a psychologist (specialist in treating emotional issues) in the team, who you should meet soon after you are diagnosed. They can talk with you about your feelings and help you to find ways of feeling better emotionally.

Glossary

Aspartame - A food sweetener that you can use instead of sugar. It does not affect blood glucose.

Beta cell - A cell that produces insulin. It is found in an area called the Islets of Langerhans in the pancreas.

Blood glucose monitoring - Measuring your blood glucose levels using a special meter.

Carbohydrates (CHO) - Types of food made of starches and sugars. Examples are rice, bread, pasta, potatoes, and cereals.

Glucagon - A hormone produced by the alpha cells in the pancreas. It causes a rise in blood glucose by releasing sugar stores from the liver. It can be injected to treat a severe hypo.

Glucose - The main form of sugar made when carbohydrates are digested. It is absorbed into the blood where it is used for energy.

Glycogen - The form in which sugars are stored in the liver.

HbA1c (Haemoglobin A1c) - This is the name given to the blood test that is done 4 times a year in clinic. This test shows what your average blood glucose control has been over the last 2 to 3 months

Honeymoon period - The period of time shortly after the diagnosis of Type 1 diabetes when insulin production is restored and blood glucose levels improve to normal, or near-normal, levels.

Hyperglycaemia (hyper) - High blood glucose (above 10mmol/l).

Hypoglycaemia (hypo) - Low blood glucose (below 4mmol/l).

Insulin - The hormone responsible for the control of blood glucose. It is produced by beta cells in the pancreas. Insulin can be injected into the body to help manage blood glucose levels. Insulin treatment can only be given by injection because the digestive juices in the stomach and intestine destroy insulin if it is taken by mouth.

Insulin-dependent diabetes - A type of diabetes that must be treated with insulin. It is the most common type of diabetes seen in children and young adults, and is also called ‘Type 1 diabetes’ or ‘juvenile-onset diabetes’.

Insulin pen - A device that looks like a large pen and carries a cartridge of insulin for injection.

Ketoacidosis - A serious condition caused by lack of insulin, which causes body fat to be broken down to release energy, and forms ketones and acids as waste products.

Ketonuria - The presence of ketones in the urine. It is detected by checking blood ketones with a Freestyle Neo or Glucomen blood ketone monitor. Ask your diabetes team for more information.

Lipohypertrophy - A fatty swelling caused by repeated injections of insulin into the same area. This swelling means that insulin cannot be absorbed properly.

Millimole (mmol/l) - The unit of measurement for testing the concentration of glucose and other substances in the blood. Blood glucose is measured in millimoles per litre (mmol/l).

Type 2 diabetes - A type of diabetes that occurs more frequently in adults, but which is becoming more common in young people.

Pancreas - The organ behind the lower part of the stomach that is about the size of a squashed sausage. It has 2 major functions - to make insulin and glucagon so that the body can control glucose availability, and to make enzymes (chemicals) that help the body to digest food.

Polydipsia - This is a symptom of high blood glucose levels which makes you feel incredibly thirsty and need to drink a lot.

Polyuria - This is a symptom of high blood glucose levels, which causes you to produce extra urine.

Meanings of diabetes-related words

Renal threshold - The amount of glucose in the blood that your body can tolerate before it causes polyuria. This is usually around 12mmol/l.

Sorbitol - A chemical related to sugar which is used as a sweetening agent. It does not affect the blood glucose level, but it may have a laxative effect and make you open your bowels (poo) more often.

Subcutaneous injection - An injection through the skin and into the layer of fat that lies between the skin and muscle.

Sucrose - A sugar produced from sugar cane or sugar beet (ordinary table sugar). It works the same as glucose so will raise blood glucose.

Quiz answers

Page 8. 1. Glucose, 2. Insulin, 3. Beta cells, 4. Insulin,5. Sugary food
Page 19. 1. True, 2. True, 3. True, 4. False
Page 28 1. Tummy, 2. It gets ‘lumpy’, 3. In a sharps bin
Page 61. 1. a, 2. a and c, 3. b

What care you can expect after diagnosis

You will be invited to a diabetes clinic at least every 3 months, and at first more often than this. At the clinic:

- you will see a diabetes consultant, a specialist registrar, a paediatric diabetes nurse specialist, a dietitian and a psychologist
- your height, weight, blood glucose level, HbA1c, blood pressure and urine will be checked
- you will be given more information to add to your understanding of diabetes
- you can ask questions about how to manage your diabetes
- your injection sites will be checked
- you will be asked to come for an annual review, where you will have your blood, feet and urine checked

Remember to always bring your blood glucose meter, insulin pen with fast-acting insulin, as well as appropriate hypo treatment with you.

We expect you to:

- make contact with the team on a regular basis, and send us downloads of the meter/pump
- attend your diabetes appointments
- attend structured education sessions
- look after your diabetes equipment
- let the team know when you are having problems with your blood glucose control

Disability living allowance

Families can claim Disability living allowance. If you are already receiving other types of benefits, you are sometimes entitled to claim Carers allowance as well. If you would like an application form, contact the Benefits Agency,
phone 0800 1214 600.

Diabetes UK has produced a guideline to assist you in completing the form, (please ask for help if needed). Please note that you cannot apply for benefits until 3 months after your child has been diagnosed. For more information, visit,
web www.direct.gov.uk/disabled

Useful contacts and phone numbers

Diabetes UK
A useful source of all information about diabetes, including tips for holidays, school support, legal advice regarding employment, weekends, summer camps, recipes and more. **Phone** 0345 1232 399
email helpline@diabetes.org.uk
web www.diabetes.org.uk

Diabetes UK Family Support Group
Part of Diabetes UK, offering help, support and advice for young people and families living with Type 1 diabetes in Lewisham, Lambeth and Southwark. **email** dukllands@gmail.com
web www.lslfamilysupportgroup.diabetesukgroup.org

Juvenile Diabetes Research Foundation (JDRF)
The Juvenile Diabetes Research Foundation supports paediatric diabetes research.
phone 020 7713 2030
web www.jdrf.org.uk

Children with Diabetes
An online community for kids, families and adults with diabetes.
web www.childrenwithdiabetes.com/uk

FRIO
FRIO bags keep your insulin cool and safe.
web www.friouk.com

MedicAlert
MedicAlert provides emblems and jewellery bearing vital details about your illness or condition for quick diagnosis in an emergency.
phone 0190 8951 045
web www.medicalert.org.uk

Medi-Tag
Your details can be engraved onto the back of your Medi-Tag medical ID to provide others with instant knowledge about your condition in an emergency.
phone 0121 200 1616
web www.medi-tag.co.uk

Digibete
Films and resources to help manage Type 1 Diabetes 24/7
web www.DigiBete.org

T1 resources
A selection of online resources to make type 1 diabetes a little easier to live with - checked and reviewed by both healthcare professionals and people with diabetes.
web www.t1resources.uk/

Run Sweet
A website for people with diabetes, but focusing on sport. **web** www.runsweet.com

Patient UK
Health information and advice.
web www.patient.co.uk

National Institute for Health and Care Guidelines for the treatment of Type 1 diabetes.
web www.nice.org.uk//guidance

NHS website
Online information and guidance on all aspects of health and healthcare, to help you take control of your health and wellbeing.
web www.nhs.uk

Useful publications and apps

Diabetes through the looking glass: seeing diabetes from your child's perspective: a book for Parents of children with diabetes.

Dr Rachael Besser (2009)

Type 1 diabetes in children, adolescents and young adults: how to become an expert on your own diabetes.

Dr Ragnar Hanas (2009)

Carbs & cals: a visual guide to carbohydrate and calorie counting for people with diabetes.

Chris Cheyette (2013)

Recommended apps

- Carbs and Cals
- DigiBete

Contacts for patients seen at Evelina London Children's Hospital

Evelina London Medicines Helpline

If you have any questions or concerns about your child's medicines, please speak to the staff caring for them or contact our helpline, **phone** 020 7188 3003, Monday to Friday, 10am to 5pm **email** letstalkmedicines@gstt.nhs.uk

Your comments and concerns
For advice, support or to raise a concern, contact our Patient Advice and Liaison Service (PALS), **phone** 020 7188 8801 **email** pals@gstt.nhs.uk. To make a complaint contact the resolution department **phone** 020 7188 3514 **email** complaints2@gstt.nhs.uk

Language and accessible support services
If you need an interpreter or information about your care in a different language or format, please get in touch, **phone** 020 7188 8815 **email** languagesupport@gstt.nhs.uk

Notes

Other useful information

All information correct at time of going to press.

The information contained within this booklet was developed for use at Evelina London Children's Hospital by: Ann Oboko, Barbara Widmer, Jo Stimpson, Alice Bailey, Sheryl Diprose, Dr Michal Ajzenzstejn, Alexis Prince, Penny Jackson, Anne-Marie McKillup, Dr Michael Cornish and Dr Jen Rundle.

With thanks to: Ann Oboko, who kindly gave us permission to adapt and reproduce the diabetes handbook.

And further thanks to Jill Cross and all of the parents for their valuable reviews and feedback, especially Liz Varlow.

Designed by: Juliette Kentish, Maxine Tomlinson, Liz Aylward, Karen Breine, Claire Parsloe, Niona Milne, Edna Stewart, Ann Oboko and Becky Philpott.

Drawings by: Will Roose.

Leaflet number: 3870A/VER3
Date published: June 2023
Review date: June 2026

A list of sources is available on request