

Diabetes and diet (multiple daily injections)

**Paediatric Diabetes
Specialist Team**

Patient Information Leaflet



Contents

What is type 1 diabetes?	Page 3
Diabetes and eating	Page 4
Carbohydrates	Page 5
Sweeteners	Page 7
Snacks	Page 8
Healthy eating	Page 9
Food labels and ingredients lists	Page 11
Fast food and eating out	Page 14
Hypoglycaemia	Page 15
Exercise	Page 17
Illness	Page 19
Holidays	Page 20
School trips	Page 21
Food refusal	Page 22
Weight management	Page 23
Type 1 diabetes and young adults:	
Alcohol	Page 25
Clubbing and partying	Page 26
Can I find out more?	Page 27

What is type 1 diabetes?

- Type 1 diabetes is a condition where there is too much sugar (glucose) in the blood which the body is unable to use properly. This is because the body is no longer producing insulin.
- Glucose comes from the food we eat and is used for energy in the body.
- Normally a hormone called insulin regulates the level of glucose in the blood.
- If there is not enough insulin, the level of glucose in the blood rises. This can make your child feel thirsty, tired, lead to weight loss and make them pass urine a lot.
- Your child will need to have insulin injections every day so that the level of glucose is kept within the target range (ideally 4-7mmol/l).
- Insulin injections, diet and exercise are all equally important in managing diabetes. It is important that your child follows some dietary guidelines to help keep their blood glucose at the right level.

Diabetes and eating

Is there a special diet my child should be following?

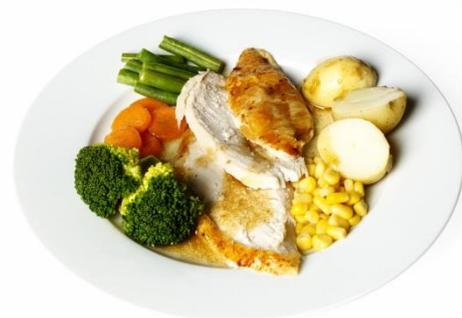
You'll be glad to know that there is no special diet for children or young adults with diabetes but the food your child eats will need to be based on healthy eating principles that are recommended for the rest of the population. It is a diet that the whole of the family can enjoy.

Why is food important?

The food we eat provides our body with energy and nutrients (like vitamins) that our body needs to work well. The energy allows us to run around, grow normally, think and carry out many other daily activities that our body needs to perform.

How can I help my child to manage diabetes?

- Give them **regular meals** and with some **carbohydrate** foods at each meal:
 - The amount of carbohydrate needed varies depending on the person so your child's dietitian will work with you to find the right balance for your child.
 - Insulin will need to be adjusted according to what your child eats so your diabetes team will talk to you about this.
- Remember snacks are not necessary between meals but if snacks are included, it is important to work out how much carbohydrate is in them – see section on 'Snacks' on page 8.
- Limit the amount of sugar, sugary foods and sugary drinks that they have.



Carbohydrates

Carbohydrates are starches and sugars and they are found in lots of foods. It is the carbohydrates in food that raise blood glucose levels.

Starchy carbohydrates

When your child has diabetes it is important that each meal contains some starchy carbohydrates. Starch is broken down slowly into glucose and gradually released into the bloodstream.

Some examples of **starchy** carbohydrates are:

- Bread
- Potatoes including crisps and chips
- Rice
- Pasta and noodles
- Breakfast cereals and porridge oats
- Starchy vegetables such as sweet potato, plantain and yam
- Foods made with flour such as chapattis, crackers, pastry and Yorkshire puddings

Sugar and sugary foods

Sugar is taken into our blood very quickly and causes a sharp rise in blood glucose levels. As your child has diabetes their body cannot cope with this fast rise in blood glucose. It may make them feel thirsty, tired and cause them to pass more urine.

This does not mean that they need to avoid sugar all the time but these types of foods and drinks should ideally be kept to times when their body needs a quick boost of energy. Two examples of this are before they exercise or if their blood sugar falls too low (hypoglycaemia).

Some examples of **sugary** carbohydrates are:

- Sugar
- Honey
- Sugary soft drinks (e.g. squash, fruit juice, lemonade)
- Jam and marmalade
- Cakes and sweet biscuits
- Chocolate
- Sweets, mints and toffees
- Ice cream
- Puddings

If your child would like a 'treat' food such as chocolate or cake, then having these as a dessert after a meal with the carbohydrate value included in the total for that meal will help to minimise the effect on blood glucose levels.

Natural sugars

Fruit contains natural sugar (fructose) so will need to be counted when it forms part of a meal. If your child is having fruit as a snack then the portion should be limited to a small handful or a piece of small fruit e.g. a kiwi. Milk and yoghurts also contain natural sugars (lactose) so will need to be counted.

Other foods

Some foods contain very little or no carbohydrate, including most vegetables, meat, fish, eggs, cheese, butter, margarine and cooking fats and oils.

Some people find that vegetables such as peas and sweetcorn have an effect on blood glucose levels. If, from experience, you notice that when your child eats these vegetables their blood glucose levels are higher than expected, then the carbohydrate content will need to be included in the total amount for that meal.

Sweeteners

Artificial sweeteners can be used as an alternative to sugar in drinks, cereals, puddings and sauces.

They are available in tablet form and granulated:

- Tablet – used for sweetening hot or cold drinks. One tablet is equal to approximately one teaspoon of sugar.
- Granulated – can be sprinkled on breakfast cereals, added to stewed fruit etc. Use spoon for spoon like sugar.

Some sweeteners are better choices than others:

- ✓ Artificial sweeteners such as aspartame, saccharin, cyclamate and acesulfame potassium (K) do not contain carbohydrate. They taste sweet but don't raise your child's blood glucose levels.

Common names of these artificial sweeteners include:

- Canderel
- Hermesetas
- Sweet'n Low
- Sweetex
- Splenda
- Nutrasweet
- Stevia

- ✗ Sweeteners such as sorbitol, malitol, xylitol and fructose contain carbohydrate and will cause your child's blood glucose to go up.

These sweeteners should be avoided. If your child does have these sweeteners you will need to remember to work out how much carbohydrate is in them.

These are often found in diabetic foods – **there is no need for your child to have diabetic foods**. They are expensive and do not help control your child's blood glucose levels.

Snacks

Your child does not need to have snacks between meals. However, if they want a snack it should contain less than 15g (grams) of carbohydrate (and they should only have one 15g snack between each meal). If the snack is greater than 15g carbohydrate then an additional injection is likely to be needed. However, the correction dose should not be given at the time they eat the snack but should only be given when they eat their next main meal.

Snacks with less than 15g of carbohydrate include:

- two cream crackers with a small amount of cheese
- two plain biscuits (such as Rich Tea or Morning Coffee)
- one digestive biscuit
- one bag of French Fries or Quavers (from a multipack as the sizes are usually smaller)
- 12 Pringles
- one small (fun-size) apple, orange or pear
- one kiwi
- one scotch pancake
- a small pot of low sugar, diet or 'light' yoghurt
- one slice of toast (medium sliced bread)

Snacks before bed

Your child should have a small 15g carbohydrate snack before bed **if their blood glucose is below 7mmol/l**. This should ensure that their blood glucose is kept at a safe level to help prevent hypoglycaemia during the night.

Healthy eating

Although multiple daily injections enable your child to eat a variety of foods, they should still follow general healthy eating guidelines.

The 'eatwell guide' below illustrates what proportions of foods our diet should include throughout the day in order for us to be healthy.



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

© Crown copyright 2018

It is recommended that sugary foods are limited as part of a healthy diet. The table below lists sugary foods and healthier options your child can swap them for.

Sugary foods to limit	Healthier options
<p>Sugar-coated breakfast cereals, such as Frosties, Coco Pops, Honey Nut Loops.</p>	<p>Porridge, Ready Brek, Shreddies, Shredded Wheat, Raisin Splitz, Weetabix, cornflakes.</p> <p>Avoid adding sugar – use a sweetener instead.</p>
<p>Sweets, cakes, chocolate, sugary biscuits like custard creams and jammy dodgers.</p>	<p>Plain biscuits such as digestives, Rich Tea, oat bars, oatcakes and Hobnobs. Scones, crumpets or rice cakes.</p>
<p>Puddings including tinned fruit in syrup.</p>	<p>Fruit – fresh and tinned in natural juice.</p> <p>Yoghurts or fromage frais.</p> <p>Sugar-free jelly, sugar-free instant whip, sugar-free custard.</p>
<p>Sweetened drinks – squash, hot chocolate, milkshakes.</p>	<p>Diet, sugar-free, no-added-sugar or low calorie squash.</p> <p>Diet fizzy drinks.</p> <p>Water, milk or low calorie hot chocolate drinks and cocoa.</p>
<p>Jam, honey, syrup, treacle.</p>	<p>Reduced sugar jam or reduced sugar marmalade. Peanut butter, Marmite, cheese spread, fish or sandwich paste.</p>

Food labels and ingredients lists

Food labels give us information to help us make informed choices about the food we are eating.

A label provides nutritional information such as how much energy, protein, carbohydrate and fat is contained in the food. They are listed per 100g of product and may also be listed per serving. This allows you to compare two foods and choose the healthier one, for example the one with less sugar in it.

Example – yoghurt

This shows a comparison of the nutritional content of two yoghurts:

Per 100g	Low-fat yoghurt	'Light' yoghurt
Energy	89kcal	50kcal
Protein	4.8g	5.1g
Carbohydrate	15.6g	7.2g
<i>of which sugars</i>	15.1g	6.6g
<i>of which starch</i>	0.5g	0.6g
Fat	1.3g	0.1g

Remember these figures are for 100g and most yoghurts are packaged in 125g to 150g tubs so it is worth checking the tub size as well.

The table below contains guidelines that tell you if a food is high in total fat, saturated fat, salt and sugar or not, which can be helpful when making healthy food choices, such as avoiding too much saturated fat or sugar:

A lot per 100g of food	A little per 100g of food
More than 17.5g total fat	3g total fat or less
More than 5g saturated fat	1.5g saturated fat or less
More than 0.6g sodium (1.5g salt)	0.1g sodium (0.3g salt) or less
More than 22.5g sugar	5g sugar or less

Nutrition claims

- **‘No-added-sugar’** – no extra sugar is added but it may contain natural sugars e.g. fruit sugar in fruit juice.
- **‘Low fat’** – beware of products that claim to be low in fat as these may be high in sugar e.g. low fat biscuits or yoghurts.
- **‘Less than 5 per cent fat’** – this means that the food has less than 5g of fat per 100g. Remember to consider the portion size – 400g of this food may contain 20g of fat which is a lot.

Ingredients

Ingredients are listed in order of weight with the largest first, for example, strawberry low fat yoghurt contains:

Skimmed milk, strawberries, sugar, stabilisers, pectin, carob, gum, flavourings, citric acid and elderberry extract

which means that in the yoghurt there is more sugar than flavourings, and skimmed milk is the largest ingredient.

When you are working out what ingredients are in foods be aware that alternative names for sugar include:

- Glucose
- Sucrose
- Fructose
- Maltose
- Glucose syrup
- Partially refined sugar syrup
- Molasses
- Treacle

Tip – any ingredient that ends in ‘ose’ is probably a sugar.



Fast food and eating out

Fast food, such as burgers, pizza and fish and chips, makes a change from your child's usual meals. However, this type of food tends to be high in fat so is best eaten only occasionally and remember, it is still important to eat a main course that includes some starchy carbohydrate and to stick to sugar-free drinks.

You will need to work out how much carbohydrate is in your child's food including all sources of carbohydrates, such as that found in milkshakes, the batter on fish and breadcrumbs on chicken nuggets.

Many chain restaurants provide the carbohydrate content of food on their websites. This will help you and your child to plan how much insulin they need.

Here are some of these websites to get you started:

Pizza Hut	www.pizzahut.co.uk
McDonalds	www.mcdonalds.co.uk
KFC	www.kfc.co.uk
Burger King	www.burgerking.co.uk
Nando's	www.nandos.co.uk
Wetherspoons	www.jdwetherspoon.co.uk
Subway	www.subway.co.uk

Hypoglycaemia

Hypoglycaemia happens when blood glucose levels fall too low. If your child's blood glucose level is 4 mmol/l or less then this is called hypoglycaemia or a 'hypo' for short.

What causes a hypo?

- A missed or delayed meal or snack
- Too little food, especially too little starchy carbohydrate
- More exercise or activity than usual
- Too much insulin

How will your child feel if they have a hypo?

Symptoms vary from person to person but they may experience some or all of the following:

- Dizziness, shaking, sweating
- Tiredness
- Headache
- Confusion, bad temper, irritability
- Blurred vision
- Slurred speech
- Hunger
- Tingling in their fingers, lips or tongue

What should I do if my child is having a hypo?

Give them something sugary (a quick acting carbohydrate) of around 15g of carbohydrate such as:

- Four glucose or five dextrose tablets
- 150ml of a full sugar drink such as lemonade or coke (a mini can), or Ribena
- 170ml of 'Original' Lucozade – other flavours may vary in carbohydrate content
- Four Starburst sweets
- Five fruit pastilles

Retest their blood glucose levels after 15 minutes, if it is still below 4mmol/l repeat the above treatment. Retest again after 15 minutes.

Once blood glucose has returned to 4mmol/l or more then give them some starchy carbohydrate (a long acting carbohydrate) to keep their blood glucose level up. This should also be around 15g of carbohydrate but if their meal is due then they should have this instead. Examples of suitable snacks are:

- A bowl of cereal
- One slice of toast (medium sliced bread)
- Half a sandwich
- Two plain biscuits

It can be useful to think back through the past day or the previous day to see what may have caused the hypo.

Exercise

Being active is an important part of a healthy lifestyle but it can make blood glucose levels more difficult to manage at times. When you exercise, glucose is used more quickly to provide the body with energy. Your child will therefore need to take extra carbohydrate or reduce their insulin dose to keep their blood glucose levels at the right level.

The amount of extra carbohydrate your child needs will depend on:

- The type of exercise.
- How long the exercise lasts.
- Your child, as everyone is different. Testing before exercise, if possible during and after exercise, is the only way of establishing the effect that different forms of exercise have on your child's blood glucose levels.

Your child should aim to have a blood glucose level of around 7-8mmol/l immediately before and ideally during exercise. If their blood glucose is below this then a snack will be required. If their blood glucose is already 7-8mmol/l then a snack may not be needed but this depends on the intensity and duration of the exercise.

In general, your child will need 15g of something sugary (a quick acting carbohydrate) for every 45 minutes of strenuous activity. Pre-exercise snack suggestions include:

- four glucose or five dextrose tablets
- 150ml of a full sugar drink such as lemonade, coke or Ribena
- 170ml of 'Original' Lucozade
- Four Starburst sweets
- Five fruit pastilles
- Two jaffa cakes

If they are doing more than 45 minutes of strenuous exercise they may need to have more carbohydrate during the exercise session.

Your child should never exercise if their blood glucose level is high and they have blood ketones.

Exercise can lower blood glucose levels for up to 12 hours. More frequent testing of blood glucose levels is the only way to learn what happens with your child. They may need a small snack before bed without insulin if they have been particularly active during that day. See section on 'Snacks' on page 8 for ideas.

If you have any problems with maintaining or controlling your child's blood glucose levels during exercise please contact the Paediatric Diabetes Team on 01384 456 111 ext. 3148/3149/3150 (9am to 5pm, Monday to Friday excluding bank holidays).

Out of these hours, call the Children's Ward on 01384 244271.



Illness

Any form of illness or infection may cause your child's blood glucose to rise. Blood glucose levels should return to normal once the illness is over.

What should I do if my child doesn't feel like eating?

- Do **not** stop giving them insulin.
- Try to encourage them to drink plenty of fluids.
- Try a light diet and offer foods your child enjoys such as soup, milk, ice cream or Lucozade. Do not worry if you have to give them a few more sugary foods and sugary drinks than normal for a while.

If they need to take cough medicines or throat sweets they are available in sugar-free form.

What else should I do when they are ill?

Test their blood glucose levels more often. If blood glucose levels are above 14mmol/l then:

- Test for ketones.
- Contact the Paediatric Diabetes Team for advice on 01384 456 111 ext. 3148/3149/3150 (9am to 5pm, Monday to Friday excluding bank holidays).

or

the Children's Ward at Russells Hall Hospital on 01384 244271 outside of these hours.

Holidays

If you are going on holiday contact the Paediatric Diabetes Team for a travel plan, especially if you are going on a long haul holiday. They will advise you if any changes to your child's diet or insulin are needed.

What do I need to take for the journey?

- Carry supplies of dextrose tablets, sugary drinks and biscuits for hypo treatment in your hand luggage.
- Pack a bottle of sugar-free juice, as this may not be available when you are travelling or at your holiday destination.

What if we are flying?

- You can check with the airline as to what meals will be available so you can work out how much insulin your child will need.
- Remember that drinks cannot be taken through airport security checks, so you will need to buy sugar-free juice (or a sugary drink if your child uses this for treating a hypo) at the airport after you have gone through the security checks.

What about activities and exercise?

- Follow the information for exercise – see page 17.
- Encourage your child to drink plenty of fluids to prevent dehydration in hot weather.

Please be aware that hot weather is likely to cause fluctuations in blood glucose levels.

School trips

What do I need to think about before my child goes on a trip?

- They will still need to have their usual three meals during the day.
- Check what food is provided and make sure your child or the teachers can work out how much carbohydrate is in it.
- If sugar-free drinks are not available send plenty with them.

My child will be more active, is there anything I need to remember?

Adventure trips with lots of activity will mean that your child needs to take an exercise (sugary) snack every 45 minutes of activity. Your child will need to check their blood glucose level regularly. Please refer to exercise section – page 17.

On less active education trips your child may need extra food but can have starchy food/snacks rather than sugary snacks.

What if my child gets a hypo on the trip?

If you follow the above advice it should prevent a hypo from occurring but if your child does suffer one remind them to take four glucose or five dextrose tablets; or a sugary snack/drink repeated at 15 minute intervals until they are better; then follow this up with a plain biscuit or other starchy carbohydrate snack (see page 15).

Food refusal

Food refusal is a common problem, particularly among younger children. Whilst missing a complete meal or snack does carry a risk of hypoglycaemia, missing a small amount of starchy carbohydrate at a meal is unlikely to do so.

How can I encourage my child to eat well?

- Try to make meal times fun and relaxed.
- Vary meals as much as possible.
- Involve your child in food choices and preparation.
- Try to eat as a family by sitting at a table and preventing distractions.
- Limit mealtimes to about 30 minutes and then clear the dishes away.
- When food is eaten give lots of praise to encourage good behaviour.
- Offer a realistic portion size – start with a small portion – they can always have more if they are hungry.
- Try not to make a fuss or offer different foods or sweet foods if food is refused.
- Offer a glass of milk or fruit juice with meals or a slice of bread so even if not much of the meal is eaten, then some carbohydrate will be.

Weight management

As your child grows their body shape will change. Their weight will increase and they will grow taller. It is important for them to eat well during this time so that they can grow to their full potential. In order to be a healthy weight they will need to eat a wide range of nutritious foods and get plenty of exercise.

Excessive weight gain is not good for anyone. During adolescence, if weight increases too rapidly, it is more difficult to control blood glucose levels and it also increases the amount of insulin needed.

What causes excessive weight gain?

- Too many high fat meals and snacks.
- Little or no exercise.
- Over treating hypos or treating excessive numbers of hypos as this may mean too many calories are eaten.
- Too many sweet and chocolate snacks.

Should my child lose weight?

Weight loss during the time children are growing may cause them not to reach their full growth potential. Restricting food intake can also delay and restrict growth. For these reasons if your child is a little bit overweight it is best to get advice from the dietitian about what they should eat.

What can my child do to stop themselves from becoming overweight?

- Be physically active – children should be active for at least 60 minutes each day (remember to follow advice on exercise – see page 17).
- Choose lower fat options such as semi-skimmed milk and low fat spread.
- Choose fat-free cooking methods like baking, microwaving, grilling and steaming.

Your child's dietitian will be able to provide further dietary advice on weight management.



Type 1 diabetes and young adults

Alcohol and diabetes

It is fine to drink alcohol in small amounts. However, alcohol will lower blood glucose levels and this effect can last for up to 10 hours. It is therefore important to follow the following advice:

- Never drink alcohol on an empty stomach.
- Have a meal with starchy carbohydrate with or before drinking.
- Have a starchy bedtime snack if you have been drinking during the evening.
- You may need starchy snacks throughout the time that you are drinking.
- Carry identification and hypo supplies with you. Make sure your friends know that you have got diabetes. **A hypo can be mistaken as drunken behaviour, which can be extremely dangerous if left untreated.**

What are the recommended alcohol units and guidelines?

Women: a maximum of two units in one day.

Men: a maximum of two units in one day.

One unit is:

- a small glass of wine (125mls)
- half a pint of beer, lager, cider or bitter
- a pub measure of spirits (one shot)

In a week you should allow two to three alcohol free days to let your liver recover.

As a diabetic are there any drinks that I should avoid?

- Sweet drinks such as sweet wine and cider.

- Full sugar mixers such as lemonade or coke – choose a diet mixer instead.
- Low alcohol or ‘lite’ beers because they tend to have more sugar in them.
- ‘Alcopops’ as these are high in sugar and alcohol, containing two units of alcohol in one bottle.

Clubbing and partying

What do I need to think about?

Staying up late uses up more energy than usual so your body will use up blood sugar at a faster rate. Dancing will use up even more energy because it is exercise. These factors will cause your blood sugar to fall and could cause a hypo, either during the evening or when you are asleep. Alcohol will also lower your blood sugar levels, so if this applies to you please read the information on alcohol (page 25).

What do I need to do?

- Eat extra starchy food before you go out and during the evening.
- Eat or drink ‘exercise’ snacks whilst you are out e.g. a glass of full sugar coke or lemonade (see section on exercise page 17)
- Every 45 minutes whilst dancing have an exercise snack or drink.
- Before bed have a large snack of a starch-based food e.g. a bowl of cereal, toast, fish and chips, rice and curry.

Remember:

Always carry hypo treatment supplies in your pocket or purse when you are out and keep it by your bed at night.

Always carry identification as a hypo can be mistaken for drunken behaviour by police and if left untreated can be extremely dangerous.

Can I find out more?

There is more information on the following websites:

www.diabetes.org.uk

www.jdrf.org.uk

If you have any questions or if there is anything you do not understand about this leaflet please contact:

Paediatric Diabetes Specialist Team
Russells Hall Hospital
Pensnett Road
Dudley
DY1 2HQ

Tel: 01384 456111 ext. 3148/3149/3150 (9am to 5pm, Monday to Friday excluding bank holidays).

Out of these hours, call the Children's Ward on 01384 244271.

This leaflet can be made available in large print, audio version and in other languages, please call 0800 073 0510.

للحصول على هذه النشرة بحجم أكبر، وعلى شكل إصدار صوتي و بلغات أخرى، الرجاء الاتصال بالرقم 08000730510.

此宣传单可提供大字版本、音频版本和其它语言版本，请拨打电话：0800 073 0510。

Ulotka dostępna jest również w dużym druku, wersji audio lub w innym języku. W tym celu zadzwoń pod numer 0800 073 0510.

ਇਹ ਪਰਚਾ ਵੱਡੇ ਅੱਖਰਾਂ, ਬੋਲ ਕੇ ਰੀਕਾਰਡ ਕੀਤਾ ਹੋਇਆ ਅਤੇ ਦੂਸਰੀਆਂ ਭਾਸ਼ਾਵਾਂ ਵਿਚ ਵੀ ਪ੍ਰਾਪਤ ਹੋ ਸਕਦਾ ਹੈ, 0800 073 0510 ਤੇ ਫੋਨ ਕਰੋ ਜੀ।

Aceasta broșura poate fi pusă la dispoziție tipărită cu caractere mari, versiune audio sau în alte limbi, pentru acest lucru vă rugăm sunați la 0800 073 0510.

یہ کتابچہ آپ کو بڑے حروف کی لکھائی، سمعی صورت اور دیگر زبانوں میں مہیا کیا جا سکتا ہے۔ برائے مہربانی فون نمبر 08000730510 پر رابطہ کریں۔

Originator	Jemma Hitchcock
Reviewer	Jo Elford
Date originated	July 2014
Date reviewed	August 2020
Next review date	May 2023
Version	4
DGH ref:	DGH/PIL/00988