

Department of Nutrition and Dietetics

Paediatric Diabetes- Healthy Eating Principles for Children with Diabetes

This leaflet is for children with diabetes and their carers

Why is healthy eating important in Diabetes?

Following healthy eating principles:

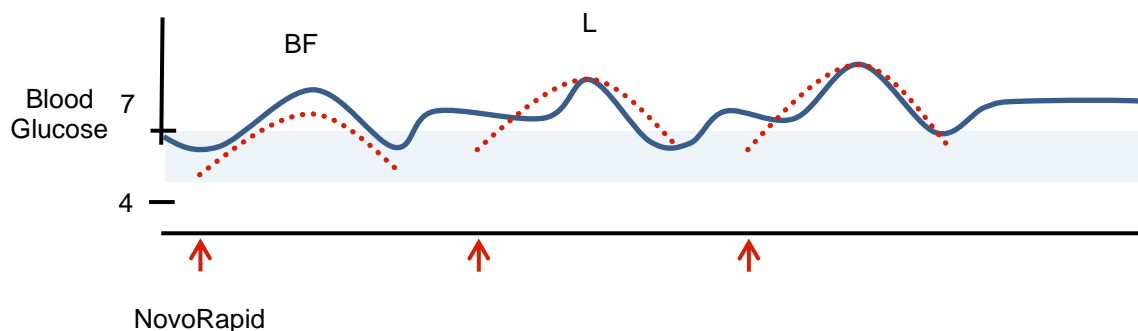
- Makes blood glucose levels easier to control, and more stable
- Helps your child avoid nutritional deficiencies, supporting optimal growth, development and immunity
- Helps your child avoid becoming overweight or obese, which would raise the risk of long-term cardiovascular disease, stroke, cancer and other complications. Overweight and obesity are independent risk factors for these complications.
- Helps your child's body preserve its sensitivity to insulin. Overweight and obesity increases the body's resistance to insulin, which then raises insulin requirements and drives further weight gain.
- Behaviours, habits, likes and dislikes practiced during childhood become those practiced throughout adulthood. By practicing and promoting healthy eating habits with your child now, you will give them the tools and habits necessary for them to remain healthy for the rest of their lives.



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Meal pattern on MDI Therapy

Children and young persons on multiple daily injections should have 3 regular meals, with insulin given 10-15 minutes prior. A mid-morning and mid-afternoon snack can be offered, but must be kept under 5g carbohydrate. A bed-time snack should be kept under 5g carbohydrate.



Following this structure will help keep your blood glucose levels within or as close to ideal range (4-7mmol/L).

Balanced meals

All 3 meals should consist as a minimum of:

- $\frac{1}{4}$ of plate as protein foods,
- $\frac{1}{4}$ of plate as starchy carbohydrate foods and,
- $\frac{1}{2}$ of plate as vegetables (as shown to the left).



Missing this minimum balance can result in hunger between meals, and make blood glucose levels more difficult to control for the rest of the day. If dessert is desired, fruit with or without plain yoghurt is the healthiest option.

Although eating carbohydrate foods means having to give an insulin injection, it is important not to skip carbohydrates in meals. Insulin plays a crucial role in growth and development in addition to stabilising blood glucose levels, and having carbohydrate provides a necessary

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opportunity for children with diabetes (who are deficient in insulin) to receive this important hormone. **Carbohydrate foods are essential for adequate weight gain and growth.**

Protein foods help slow-down the rise of blood glucose after a meal, and keep children satiated for longer. Whilst carbohydrate is used up by the body within 2 hours post meal, protein will take longer to run out. This means that missing protein in meals will result in hunger much earlier than the next scheduled meal, and children will ask for more snacks between meals. **Including protein in the 5g carbohydrate pre bed-time snack can also help provide steadier blood glucose levels throughout the night.**

Vegetables provide essential vitamins and minerals. They are also high in fibre, which further contributes to satiety. Because vegetables are low in energy, **eating vegetables with every meal can help prevent or manage weight gain and obesity.**

Snacks

The mid-morning and mid-afternoon snack should be kept under 5g carbohydrate. This is to avoid hyperglycaemia, so if your blood glucose levels are already high (>14) it is better to choose a carb-free snack or no snack.

Snacks should be offered in response to hunger, not boredom, reward, comfort or habit.

Just like meals, **snacks should consist of healthy foods** not discretionary or processed foods. If your child is hungry, offer the following categories (in order of preference):

1. Vegetables
2. Fruit
3. Plain un-flavoured yoghurt or milk
4. If your child is still hungry, you can “bulk-up” their snack with: sugar-free jelly, home-made sugar-free ice lollies (made from sugar-free squash), cheese, and chicken. However, **this should not be routinely necessary, and if occurring frequently may indicate a need to increase meal-time portions or improve meal balance.**

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5. 1-2x plain biscuits. **This is a less preferred option**, as the amount of biscuits needed to stay under the 5g carbohydrate limit (1-2) is often insufficient to satisfy hunger, and they provide less nutritional benefit than snack options 1-3.
6. **Avoid offering Pepperami, ham and processed meats** as snacks. Though these foods are low in carbohydrate, they are high in fat and salt and are associated with adverse health outcomes, particularly in people with Diabetes.

For specific snack options and carbohydrate content of these, please see the “Snacks” leaflet.

Food groups and daily portion recommendations for each age

It is helpful to understand daily portion recommendations for your child so you can make sure they are receiving adequate amounts of all essential nutrients, whilst avoiding excessive intakes. Portion sizes are listed in grams so you can weigh foods and get an idea of what a portion is.

Below are listed recommended daily serves for each age group. **Recommendations apply to all children (with or without diabetes), therefore all members of the family are encouraged to follow them.**

Note: Children rarely eat exactly the same way every day, and it is common to have a bit more on some days than others. On average, the total of their portion sizes should be similar to the total number of portions recommended for each day.

If your child eats portions that are smaller than the standard portion, they will need to eat from the different food groups more often. If your child's portion size is larger than the standard portion listed, they will need to eat less often.

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Vegetables: portions per day

	2-3 years	4-8 years	9-11 years	12-13 years	14-18 years
Boys	2 ½	4 ½	5	5 ½	5 ½
Girls	2 ½	4 ½	5	5	5

A portion is 75g (e.g.):
 ½ cup cooked green or orange vegetables
 1 cup green leafy or raw salad vegetables
 1 medium tomato
 ½ cup canned vegetables*



Fruit: portions per day

	2-3 years	4-8 years	9-11 years	12-13 years	14-18 years
Boys	1	1 ½	2	2	2
Girls	1	1 ½	2	2	2

A portion is 150g (e.g.):
 1 medium banana, apple or pear
 2 small apricots, plums or kiwi fruit
 1 cup diced or canned fruit*
 Children with diabetes should avoid dried fruit and/or fruit juice
 *no added sugar

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Grains and cereals (mostly wholegrain and/or High Fibre varieties): portions per day

	2-3 years	4-8 years	9-11 years	12-13 years	14-18 years
Boys	3	3	4	5	6
Girls	3	3	3	4	6

A portion is 120kcal (e.g.):

1 slice bread

½ medium roll or flat bread

½ cup cooked rice, pasta, noodles, barley

½ cup cooked porridge

2/3 cup wheat cereal flakes

1 small crumpet, English muffin or scone



Lean meats, poultry, fish, eggs, nuts and legumes: portions per day

	2-3 years	4-8 years	9-11 years	12-13 years	14-18 years
Boys	1	1½	2½	2½	2½
Girls	1	1½	2½	2½	2½

A portion is 120-150kcal (e.g.):

65g cooked lean meats (beef, lamb, pork, goat)*

80g cooked lean poultry (chicken, turkey)

100g cooked or canned fish

2 large eggs

1 cup cooked or canned beans, chickpeas or lentils

*Weekly limit of 455g

Aim for at least 2 portions per week of fish and at least 1 portion of oily fish (anchovies, herring, mackerel, pilchards, salmon, sardines, sprats, trout, fresh tuna or whitebait). Oily fish contain omega 3 fats which can help lower cholesterol and reduce risks of heart disease and stroke.

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Do not exceed 2 portions of oily fish per week for girls and 4 per week for boys.



Milk, yoghurt, cheese and/or alternatives

(mostly Reduced-fat): portions per day

	2-3 years	4-8 years	9-11 years	12-13 years	14-18 years
Boys	1½	2	2½	3½	3½
Girls	1½	1½	3	3½	3½

A portion is 120-150kcal (e.g.):

1 cup (250ml) semi skim milk

½ cup evaporated milk

2 slices (40g) hard cheese (cheddar)

¾ cup (200g) plain yoghurt

1 cup (200ml) soya, oat, almond or coconut milk (with at least 100mg calcium added per 100mL)

Unsaturated spreads, oils, nuts and seed butters

May be included in the following allowance

- 2-3 years: 4-5 g daily or 1 teaspoon daily total
- 4-11 years: 7-10g daily or 2 teaspoons daily total
- 12-13 years: 11-15g daily or 2-3 teaspoons daily total
- 14-18 years: 15-20g daily or 3-4 teaspoons daily total

Fluids:

- Drink plenty of **water** instead of juice, fruit drinks, sugary squash, energy drinks, sports drinks or fizzy pop.
- **For special occasions, sugar-free squash or diet fizzy pop may be offered, but is not recommended on a regular basis.**
- Diet fizzy pop is still acidic and harmful to teeth and the inner lining of your digestive system.

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- Sugar-free squash may not affect your child's blood glucose levels but its sweet taste will still drive sweet cravings, and undermine efforts to avoid discretionary foods.



Discretionary foods:

- Discretionary foods are foods which **are high in fat, sugar, and/or salt, generally highly processed and with low content of vitamins and minerals.**
- They are not a necessary part of the diet and **can be completely excluded without any nutritionally adverse effect** in the general healthy population.
- **Regular intake of discretionary foods in people without Diabetes increases risk of obesity, cardiovascular disease, stroke and the metabolic syndrome.**
- For people with diabetes, there is also an increased risk of diabetic complications. **Therefore, it is vital all adults and children limit their intake of discretionary foods, whether or not they have diabetes.**
- If like the majority of British families, your family is used to a higher consumption of these foods, it may seem like a big change initially. However, in the long-term **limiting these foods will substantially benefit all family members (not just the person with Diabetes) and it is the single most important dietary change you can make** to help you and your family enjoy life-long health.
- **Limit discretionary foods to 0-2 portions per week maximum.**

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The following table summarises examples of discretionary foods equivalent to 1 serve.

High in sugars	High in saturated fat	High in fat and sugar
<p>5-6 (40g) haribos, jelly babies, chocolate covered fruit and other sweets</p> <p>1Tbsp (60g) jam, honey, syrup, ketchup, barbecue sauce or sweet chili sauce</p> <p>½ can (150ml) soft drink, energy drink, sports drink, smoothies, milkshakes or juice</p> <p>50g Petit filous, Frubes, Muller corner, Muller rice or other flavoured yoghurt or custard</p> <p>30g coco pops, rice krispies, crunchy nut, cookie crisps, frosted flakes, cheerios, and any other sugary cereal</p>	<p>2 slices (50-60g) processed meats (ex. Salami, bacon, haggis, pate)</p> <p>1.5 thick or 2 thin sausages</p> <p>¼ (60g) meat pie, pasty, or sausage rolls</p> <p>½ slice takeaway pizza, fast-food burger, or kebab</p> <p>12 (60g) hot chips, potato waffles, potato smiles, onion rings, Yorkshire puddings</p> <p>3-4 (60g) chicken nuggets, fish fingers or fish cakes</p> <p>½ packet (30g) salty crackers, tortilla chips, puffs, veggie crisps or crisps</p> <p>2 Tbsp. (40g) cream, salad cream, mayonnaise, cream cheese</p> <p>1Tbsp (20g) butter</p>	<p>2 scoops (75g) ice-cream</p> <p>1 Tbsp. (20g) chocolate spread</p> <p>2-3 sweet biscuits</p> <p>1 small (40g) doughnut, iced bun or cake bar</p> <p>1 slice (40g) plain cake or small cake-type muffin</p> <p>½ small (25g) chocolate bar</p> <p>1 small (30g) cereal or muesli bar</p>

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For times when you would like to give your child a discretionary food, it is better to offer it after meals with the appropriate amount of insulin to match the carbohydrate content.

Salt

A high salt intake can raise blood pressure which is an independent risk factor for some diabetes complications and cardiovascular disease. The majority of Britons eat excess amounts of salt, and **over half of our salt intake comes from discretionary and processed foods**. Therefore, limiting intake of discretionary foods to 1-2 per week is the single most important dietary measure you can take to ensure your Child's intake of salt is not excessive (less than 3g of salt per day). Avoid adding extra salt at the table, and cooking with stock cubes.

Diabetic foods

Don't be fooled by foods marketed as "Diabetic foods" or "Superfoods". There is very lax government regulation for these claims, **and no evidence they are actually any healthier than the standard foods**, however these can be more expensive and sometimes have higher fat or sugar content than their standard alternatives. **It is better to have the standard discretionary food, as long as you limit it appropriately and for children with diabetes, match it with insulin at meal times.**

How to understand nutrition labels on foods

Nutrition Information		
Servings per package – 16		
Serving size – 30g (2/3 cup)		
	Per serve	Per 100g
Energy	432kJ	1441kJ
Protein	2.8g	9.3g
Fat		
Total	0.4g	1.2g
Saturated	0.1g	0.3g
Carbohydrate		
Total	18.9g	62.9g
Sugars	3.5g	11.8g
Fibre	6.4g	21.2g
Sodium	65mg	215mg
Ingredients: Cereals (76%) (wheat, oatbran, barley), psyllium husk (11%), sugar, rice, malt extract, honey, salt, vitamins.		

Total fat: In general, choose foods with **less than 10g fat/100g**. Choose **milk**, ice-cream or yoghurt with **less than 2g fat/100g**. Choose **cheese** with **less than 15g fat/100g**.

Saturated fat: Aim for lowest. **Less than 3g/100g is best.**

Sugars: Aim for lowest. Choose yoghurts with **less than 6g/100g**.

Fibre: Aim for highest. Choose breads and cereals with **more than 3g per serve**. Not all labels include fibre.

Sodium: Choose lowest option among similar foods. Less than 400mg/100g is good, **less than 120mg/100g is best.**

Ingredients: Listed from greatest to smallest by weight. Use this to **check first 3 ingredients for sugar, salt and/or saturated fat**. Avoid those foods.

Fussy Eaters

It is fairly common for children to prefer foods they are most familiar with. However, **food preferences are dynamic and simply reflect the foods they have been exposed to the most**. In order to get your child to eat a wider variety of foods it is important to continue to offer and expose them to a wide range of foods even if they initially refuse.

Tips to help your child eat new foods:

- Try to approach dietary changes in a positive light. Rather than focusing on what the family are no longer “allowed”, focus on all the new food discoveries and experiences this will lead to.
- Get them involved in choosing these in the supermarket, selecting the recipe, and preparing them. Use it as an opportunity to spend quality and fun time together.

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- Children are more likely to eat foods those around them eat. Lead by example.
- It takes a person on average 16x trials of a new food before they become familiar with and enjoy its flavour. Keep trying!
- Try the same new food in different recipes and cooking methods. For example, scrambled egg, omelette (with varying ingredients), hard-boiled egg, fried egg all taste very different and trying different preparations can increase the likelihood your child will find an option they like.
- Take your child to a pick-your-own farm in the summer, or consider growing a few vegetables in the back yard. Children like to learn where foods come from, and are more likely to eat foods they grow and/or prepare themselves.

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My lifestyle goals are:

Use the space below to write down any changes you would like to make from today.



:



:



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My Meal Plan

As there is so much new information initially and often many dietary changes to keep track of, **as a starting point it may be helpful to follow a meal plan to make it easier to start building new habits.**

	Weekdays	Weekends
BF		
MM		
L		
MA		
D		
BB		

Key: Breakfast (BF), Mid-morning snack (MM), Lunch (L), Mid-afternoon snack (MA), Dinner (D), Before-bed snack (BB).

Patient Information

Your Dietitians:

Name: Hayley Jordan (Paediatric Diabetes Dietitian)
Andrea Gallanders (Paediatric Diabetes Dietitian)

Telephone: 02476966161

When will you see your Dietitian?

- **At diagnosis on the ward** for initial Dietetic education and training
- **After discharge, your Dietitian may visit you at home** to continue to support you with hands-on carb-counting practice and answer any remaining questions
- **One to four times per year, at your Diabetes Consultant clinic** your Dietitian may sit in with you during appointments
- **Once per year**, you will be asked to bring your child to a one-to-one appointment with your Dietitian. This **annual Dietetic review** is a unique opportunity for your Dietitian to assess the adequacy of your child's diet, and to recap on the Dietetic principles and skills needed for optimal Diabetes management. This one-to-one structure allows for more in-depth exploration of Dietetic information than that available at consultant clinics.
- **Additional appointments are available on request.**

An additional appointment with the Dietitian is also required as part of the insulin pump pathway and for the CGMS pathway.

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