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NHS Foundation Trust



Type 2 Diabetes and pregnancy

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Diabetes and pregnancy

Type 2 diabetes occurs when the body is no longer able to produce enough insulin and/or the body becomes resistant to the insulin it does produce. Insulin is a hormone important for blood glucose (sugar) regulation. Insulin acts as a key to open your body cell doors allowing glucose to enter and be used for energy.

Ineffective insulin leaves glucose in the blood raising the blood glucose levels. In pregnancy the hormones produced by baby growing can also hinder the effectiveness of your insulin which in turn raises blood glucose levels.

Having raised blood glucose can cause your baby to grow too big due to them receiving too much glucose and storing it as fat. Good blood glucose control throughout pregnancy will reduce the risk of a large baby, trauma during birth (for mother and baby), caesarean section, neonatal hypoglycaemia (low blood glucose) and perinatal death.

How is this treated?

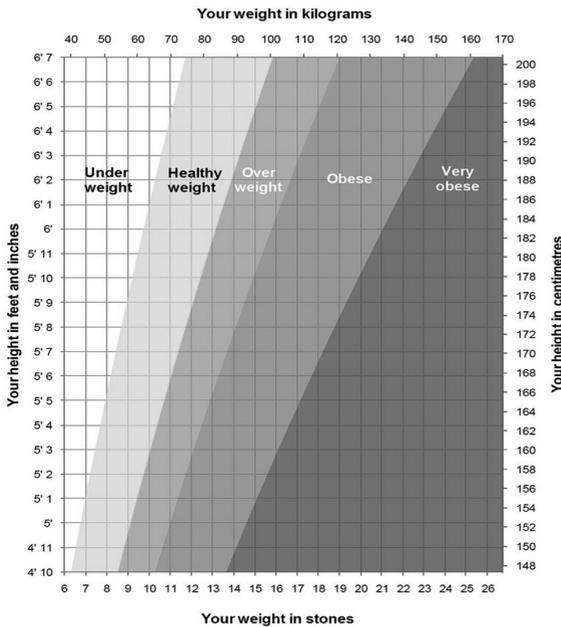
A healthy diet and lifestyle can help to control your blood glucose levels, however some people may require medication i.e. tablets and/or insulin.

Resistance to insulin is often caused by carrying extra weight. It can improve with weight loss. Therefore it is important to keep following a healthy diet and active lifestyle after pregnancy too. If you carry additional weight try to lose weight after pregnancy.

A healthy Body Mass Index (BMI) is between 18.5–25 for caucasians and between 18.5–23 for people of south asian, chinese, black caribbean/african, and eastern european ethnicity.

Healthy weight gain during pregnancy

During pregnancy, a healthy weight gain is usually between 10kg and 12.5kg, with pre-pregnancy BMI used as a guide. Most weight gain is usually after week 20. An additional 200kcal per day is all that is required in the third trimester to meet the needs of your growing baby. 200kcal is not a lot, it could be as little as an extra glass of milk and piece of fruit per day.



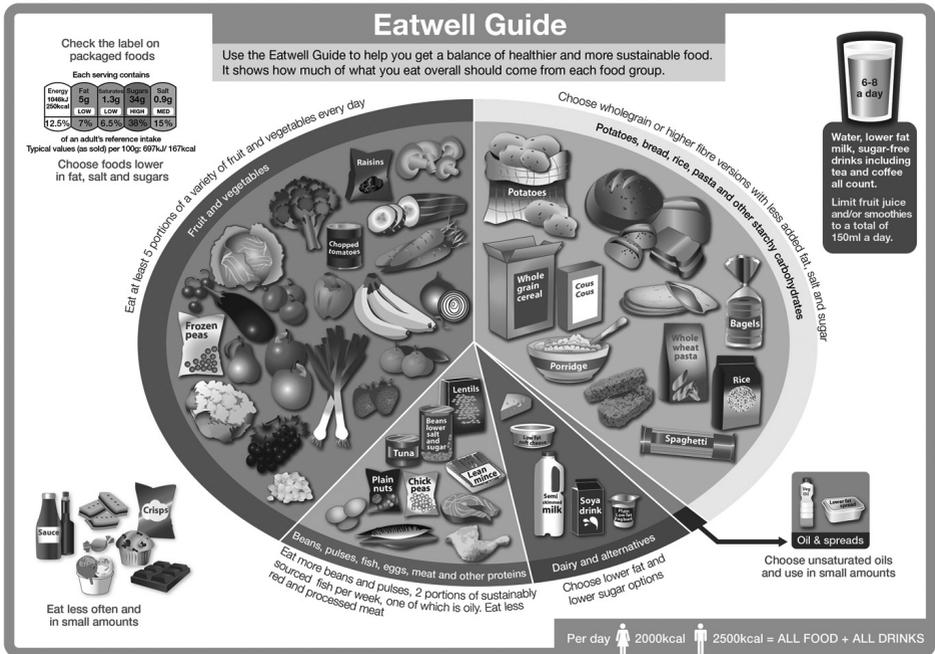
Body Mass Index (kg/m ²) pre-pregnancy	Healthy total weight gain during pregnancy
< 18.5 Under weight	12.7kg–18.1kg
18.5–25 Healthy weight	11.3kg–15.9kg
25–30 Overweight	6.8kg–11.3kg
> 30 Obese	5kg–9kg

Healthy diet and lifestyle is key to managing diabetes

- Aim for regular meals, snacks and avoiding long gaps
- Balance out carbohydrates within meals with vegetables, salad, protein and healthy fats
- Choose nutritious lower glycaemic index foods (low GI), for example whole grain starchy foods, pulses, fruit and vegetables
- Limit highly processed carbohydrates such as white breads, ready meals and refined cereals
- Reduce intake of high added sugar foods and drinks
- Choose reduced fat options
- Try not to add salt to food or cooking
- Avoid diabetic foods. The law has changed such that manufactures can no longer label food as suitable for diabetics. These foods do not have any special health advantage and can still affect blood glucose levels
- Increase physical activity especially after meals
- Aim to reach a healthy weight after your pregnancy

Am I eating the right balance of foods?

We recommend eating a healthy balanced diet which has well controlled portion sizes and regular spaced meals.



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

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Carbohydrate foods break down into glucose directly affecting blood glucose levels. Carbohydrates fall into three main categories: starchy, natural sugars and refined sugars (often found in processed foods).

Starchy	Natural sugars	Refined sugar
Bread, Chapatti	Fruit	Table sugar all types
Potato, cassava	Milk	Syrups
Rice	Yoghurt	Cakes
Pasta	Some sweet veg	Biscuits
Noodles	Peas, Sweetcorn	Ice-cream
Breakfast cereal		Fizzy drinks
Crisp breads		Sweets
Yam, Plantain		Burfi, Jalebi and
Pulses, lentils		Gulab jamun

Food Group	Helpful Tips
<p>Starchy carbohydrates such as bread, chapatti, rice, potatoes, pasta</p> <p>5-14 portions per day</p>	<p>Stick to a quarter of your plate being carbohydrate</p> <p>Opt for higher fibre whole grain options, limit refined options</p> <p>Increase fluid intake if consuming more fibre</p>
<p>Fruit and vegetables</p> <p>5-9 portions per day</p>	<p>Aim for a variety of fruits and vegetables</p> <p>Keep skins on fruit but wash well</p> <p>Limit fruit juice to 150ml glass per day</p>
<p>Meat, fish, eggs, beans</p> <p>2-3 portions per day</p>	<p>Beans, pulses and lentils release energy slowly and are high in fibre</p> <p>Choose lean cuts of meat and trim off skin and visible fat</p>
<p>Milk and dairy foods</p> <p>2-3 portions per day</p>	<p>Choose 'diet'/'light' yogurts or plain low fat yoghurts</p> <p>Swap whole fat milk (blue) to semi or skimmed (green or red)</p> <p>1/2 fat or reduced fat cheese</p>
<p>Food and drinks high in fat and/or sugar</p> <p>0-4 portions per day</p>	<p>Use diet or sugar free fizzy drinks and squashes</p> <p>Use rapeseed or olive oil in cooking-limit animal fats in cooking such as butter and ghee</p> <p>Avoid use of any type of table sugar</p> <p>Only eat plain sweet foods such as scones, teacakes, rich tea biscuits in small amounts occasionally</p>

How much is a portion?

Starchy carbohydrates

One portion provides around 15g to 20g of carbohydrates and about 80 calories, for example:

- Two egg sized boiled potatoes (weigh 65g each)
- Two tablespoons of cooked rice or pasta (weigh 30g each)
- 80g plantain boiled (approx. 1/3 of one small)
- One Weetabix or one tbsp. muesli, or two tbsps. cereal (weigh 15g)
- One medium slice of bread, 1/2 small chapatti or one small pitta
- Six chips or 1/2 baked sweet potato
- Two crackers or one rye crisp bread
- 1/2 scone or 1/2 slice malt loaf

Small meals - Aim for one to two carbohydrate portions, e.g. four tbsps of cereal (30g) or one to two slices of bread

Main meals often provide two to three carbohydrate portions - aim to keep portion small, covering roughly 1/4 of a dinner plate only, for example:

- Four to five tablespoons rice or pasta
- Four egg sized new potatoes or one small sweet potato
- One small chapatti or two small pitta

Fruit and vegetables

A portion is around 80g or one medium fruit. For example:

- One medium apple, pear or banana
- Two satsuma's or plums
- Twelve grapes or seven strawberries
- Handful of small berries
- Three tablespoons of tinned fruit in juice
- 150ml of pure fruit juice

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- One tablespoon of dried fruit or two to three dried dates or apricots
 - Three heaped tablespoons cooked vegetables
 - One medium bowl of salad
 - Two tomatoes or a handful of cherry tomatoes

Meat, fish, eggs, beans, pulses, nuts

- A portion is 85g of meat
- 120–140g fish (ideally without batter or bread crumbs)
- Two boiled eggs
- Three tablespoons of beans, lentils, dhal
- 200g of hummus
- Two tablespoons plain nuts or nut butter

Milk and dairy

- 30g (1oz) match box size of cheese
- 200ml of milk
- 125g pot of yoghurt

Fats

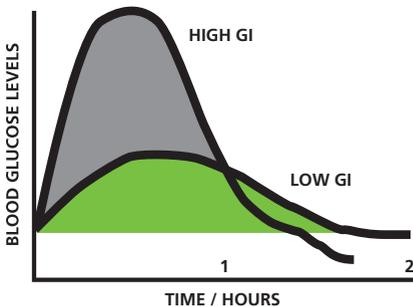
Two teaspoons of oil or 10g spreadable margarine/butter.

Glycaemic index

Low sugar and low glycaemic index (GI) foods are advised. A food with a high GI raises blood glucose quickly whereas a food with a low GI raises blood glucose more slowly. Following a low GI diet can help with controlling blood glucose levels.

Note - consuming large portions of low GI foods can still raise blood glucose levels.

High GI foods



- Cereals - Cornflakes, Rice Krispies, most sugar coated cereals.
- Breads - white and wholemeal bread, rice cakes, English muffins, baguettes, white and medium chapatti
- Potatoes - Jacket potato and Mash potato
- Rice - White rice

Limiting high GI foods will help to control blood glucose levels.

Medium to Low GI foods

- Fruit - most fruit e.g less ripe (fresher) bananas, apples, orange
- All pasta and noodles
- Most vegetables
- Bread - seedy, granary bread, rye bread
- Chapatti - wholemeal, millet or chick pea flour (Besan)
- Crisp breads - rye, wholegrain

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- Potatoes - New potatoes, sweet potatoes, yam
 - Rice - brown and basmati rice
 - Cereals - plain porridge oats (not instant), sugar free muesli (with more nuts than fruit), Shredded wheat
 - Beans, pulses and legumes such as chick peas, lentils and kidney beans

Try to include one of the above with most meals

Breakfast

A lot of the foods we eat at breakfast time are high in carbohydrate. You need some carbohydrate for energy however too much can result in high blood glucose readings and also weight gain. Try having a smaller breakfast and then if needed a mid-morning snack. See snack ideas on the next page.

Example breakfast ideas:

- One rye bread with no added sugar peanut butter or low fat cheese spread
- Two small granary/ multi grain bread with 1/2 small avocado
- Three seeded crisps breads with scrambled egg
- 30g of special flakes and 200ml milk
- 15 blueberries, 150g plain yoghurt, three tbsps. mix seeds/nuts
- Small bowl porridge (whole rolled oats) with milk, cinnamon
- Scrambled tofu with peppers and tomatoes
- Mushroom and pepper omelette

Meals

Remember to balance your main meals with protein, vegetables and starchy carbohydrate.

Main meal tips

- Try replacing two tablespoons of rice with pulses or extra vegetables such as peppers, okra, carrot or aubergine or mushrooms. Bulk up curries with vegetables.
- Try swapping oil for two to five sprays of a spray olive oil or limit oil to one teaspoon per person
- If eating meat on the bone such as chicken thighs or cooking with fattier meats like goat or mutton try replacing a few pieces with more pulses such as kidney beans. These still have protein but add more fibre and cut the calories from fat
- If you are having a few different carbohydrates, e.g. plantain and rice, remember to have less rice to allow for the carbohydrate in the portion of plantain. Try to boil the plantain, you can then brush it with a little oil and bake or grill rather than fry it
- Use plenty of herbs, spices or ginger for flavour rather than salt

Ideas for healthy snacks between meals

- Soft low fat cheese, fresh onion or chive and one to two whole grain rye crisp breads
- Sugar free jelly made with water or diet lemonade and a handful of berries
- Handful of olives or a few pickles such as gherkins, pickled onions, sundried tomatoes
- One portion of fruit (handful size)
- Boiled egg, spinach and tablespoon pine nuts or seeds

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- Palm full of plain unsalted nuts or toasted seed mix (25g)
 - One 125g pot of light or diet yoghurt or 0% fat Greek style
 - Baked aubergine with spices, spinach and a teaspoon of rapeseed oil
 - Fresh one to two small avocado spread over two crisp breads
 - Two tablespoons soy/endamame beans with one to two tablespoons no added sugar peanut butter
 - Cucumber/celery or carrot sticks with two to three tablespoons hummus
 - Two tablespoons roasted tinned chick peas in a teaspoon rape-seed oil and spices
 - Roasted diced chicken breast with mixed salad, tablespoon soy beans, lemon juice, and coriander
 - Well cooked turkey kebab stick with pepper, onion and tomatoes
 - Grated courgette and carrot salad with teaspoon olive oil, onion, coriander and lemon juice or a light low sugar dressing
 - Glass of low fat unsweetened milk hot or cold
 - 25g Edam cheese and one small apple
 - A thin pakora baked on a lightly oiled baking tray

These snacks ideally should be part of a healthy balanced diet and kept to only one snack per any 'snacking time' to ensure blood glucose levels remain stable. **See Diabetes UK recipes for some more ideas.** Try swapping crisps, biscuits, cakes to some of the healthy snacks above.

Food Labelling

Traffic light labels on foods make it easier to choose healthy options. Some supermarkets are using their own labelling systems. What supermarkets class as low, medium and high sugar products are for the general population. Please use this guide below as this is suitable for people with diabetes.

All measures per 100g	LOW A healthier choice	MEDIUM OK most of the time	HIGH Just occasionally
Sugars	5g or less	5.1g–22.5g	More than 22.5g
Fat	3g or less	3.1g–17.5g	More than 17.5g
Saturates	1.5g or less	1.6g–5g	More than 5g
Salt	0.30g or less	0.31g–1.5g	More than 1.5g

To apply traffic lights to a product, look at the **“per 100g”** information panel on the pack and use this grid to make a healthier choice. Not all foods will fit into a low sugar category, for example even light yoghurts have a natural dairy sugar in them which may make them a medium sugar product. It is still a healthy choice in moderation. It is also a good idea to check the ingredients list to see if sugar, dextrose or syrups have been added as these are likely to be higher sugar products.

Example food label

0% fat Greek Yoghurt - Nutrition

Typical Values

Energy

Fat

of which saturates

Carbohydrates

of which sugars

Protein

Salt

Calcium

%NRV

*Nutrient Reference Values

Typical Values per 100g

230KJ (54 Kcal)

0g

0g

3.0g

3.0g

10.3g

0.1g

120mg

15%

-

of which sugars - This tells us how much of the product is either a natural sugar (fruit or dairy sugars) or added sugar. We have to look at the ingredients list to check which it contains.

Carbohydrate - This tells us how much of the total amount of the product breaks down into sugar, it includes the starchy carbohydrates, natural sugars and added sugars.

Ingredients

Pasteurised skimmed milk, liver active yoghurt cultures (L. Bulgaricus, S. Thermophilus, L. Acidophilus, Bifidus, L. Casei)

This 0% fat greek yoghurt does not have added sugar listed in the ingredients therefore we can assume the sugars are natural dairy sugars. It is only 3g of total carbohydrates, and the sugars are less than 5g per 100g therefore it is a good choice. Remember to eat a portion, e.g. 125g of yoghurt.

Does it matter when I eat?

It is important to eat regularly. Eating your normal meals and snacks spread out evenly throughout the day can help to prevent large swings in blood glucose after meals. For example:

	Current diet	Instead, you could have...
Breakfast	Cereal and one slice of toast	Small bowl of high fibre cereal and a low carbohydrate mid morning snack
Lunch	Sandwich and fruit	A sandwich for lunch and the fruit as a mid afternoon snack
Evening meal	Rice chapatti and curry	Four tablespoons of basmati rice OR one small hand sized chapatti. Bulk up the curry with vegetables and protein. Try not to have bread and rice together

Do I need to avoid any foods during pregnancy?

General food hygiene is important whilst pregnant

- Make sure hen eggs have the lion stamp, these can now be eaten lightly cooked/runny if preferred due to a low risk of salmonella. If eggs are not British lion stamped, not hen eggs or from outside of the UK please still fully cook until hard as a low risk of salmonella cannot be guaranteed
- Avoid under cooked meats and keep raw and cooked meat separate
- Avoid mouldy soft cheese such as Brie and Camembert and blue vein cheese. Avoid cheese made from unpasteurised milk
- You may wish to avoid cured meats such as Parma ham, salami, chorizo and pepperoni as there may be a higher risk of Toxoplasmosis infection from parasites on the uncooked meat
- Avoid cod liver oil supplements and high dose multivitamins with vitamin A present
- Avoid liver, pate, haggis and liver based products as they are very high in vitamin A which are dangerous in pregnancy
- Ensure fruit and vegetables are well washed
- Store foods as recommended and be aware of 'best before' dates

Fish

- No more than two portions (100g) of oily fish per week as it can contain pollutants like dioxins and polychlorinated biphenyls (PCBs). eg: salmon, pilchards, mackerel, sardines, herring
- Avoid eating marlin, shark or swordfish due to the mercury content
- No more than four medium cans of tinned tuna per week as it is a higher mercury containing fish
- Avoid raw shellfish, but cooked is fine. Smoked fish is safe to consume

What about peanuts?

The Department of Health advises that women who are pregnant or breast feeding can choose to eat peanuts as part of a balanced diet as long as they themselves do not have an allergy, and irrespective of whether they have a family history of allergies, (eg: eczema, asthma or an allergy to a food other than peanuts). There is no clear evidence that eating peanuts during pregnancy affect the baby.

Caffeine

It is best to limit caffeine to a maximum of 200mg per day, e.g.
Two mugs of instant coffee (100mg each) or
One mug of brewed/filter coffee (140mg each) or
Two mugs of tea (75mg each) or five cans of diet cola (50mg each)
Caffeine is often contained in cold and flu remedies - always check with your GP or pharmacist before taking medication.

Can physical activity help?

Being more physically active has many health benefits including helping your blood glucose control, managing body weight and improving mood. Being more active for 30 minutes after your meals will help to reduce blood glucose levels back down.

Aim to build up to 30–60 minutes of moderate physical activity on five days of the week. “Moderate” means breathing more deeply and feeling warmer. Try walking, gardening, housework and swimming. N.B. If you are on diabetic medication, you may need to discuss this with your diabetes team or GP before you increase your physical activity.

See what schemes and facilities are available in your area:

- <http://beactivebirmingham.co.uk>
- <http://www.solihullactive.co.uk>

Sweeteners and diabetic products

Artificial sweeteners can be used instead of sugar in foods and drinks in moderation. They can be bought as tablets or a powder. All sweeteners taste different. It is worth trying different ones to find which you prefer, for example, Stevia, Truvia or Canderel. We are currently recommending pregnant women to avoid only saccharin based sweeteners e.g. Hermesetas or Sweetex. Please check the labels of products that use sweeteners.

Some sugar substitutes are a mixture of sugar and sweetener. Make sure you avoid these as they will raise your blood glucose and they are higher in calories. This includes 'half spoon' sugar.

Diabetic foods do not give any health benefits. They can be high in fat and calories: they can be expensive and can cause diarrhoea. Opt for the no added sugar or reduced sugar options of food and drinks which are available in most shops.

Folic acid

A higher dose of folic acid which is 5mg per day is advised for woman with Type 2 Diabetes. You will need a prescription from your doctor. It is recommended prior to conception and in the first 12 weeks of pregnancy. If you are planning a future pregnancy it is important to see your GP so you can start on the 5mg of folic acid early.

Rich food sources of folate to also include in your diet are dark green leafy vegetables such as spinach, kale, brussel sprouts, cabbage, broccoli and legumes (e.g. peas, blackeye beans) and beans, peas and pulses as well as oranges. Some breakfast cereals may be fortified as well as yeast extract, e.g. Marmite.

Vitamin D

A 10µg (micro grams) vitamin D supplement is recommended during pregnancy and during breastfeeding. Your vitamin D levels will be checked by the midwife and if you have a deficiency, a higher dose will be prescribed. Vitamin D is made in the body and is dependent on a safe level of sun exposure. Many people are deficient in vitamin D in the UK. Discuss this with your doctor.

Vitamin B12

We need vitamin B12 for many reasons. Too little can result in fatigue, anaemia and nerve damage. Most people get vitamin B12 by eating animal products as plants do not produce B12. If you are eliminating all animal derived foods, the only reliable sources of vitamin B12 are fortified foods and supplements.

Vitamin B12 is added to some dairy alternative milk products, vegan spreads, yeast extracts such as Marmite and some breakfast cereals. Richer sources include meat, fish and eggs.

If your B12 levels are low, your doctor will advise a supplement which may be in tablet or injection form. Some people struggle with absorption and synthesis of B12 and rely on injection supplementation.

Frequently asked Questions

Q: I ate a large full English breakfast and noticed my blood glucose remained stable: however, the day I ate bran flakes and fruit my blood glucose rose. Why was this?

A: A full English breakfast tends to be high protein and low carbohydrate therefore not greatly impacting on blood glucose levels,

whereas bran flakes and fruit both contain carbohydrate. It is also worth considering that a regular consumption of high fat foods can have other health implications. Try having a smaller breakfast of just boiled eggs on toast or just a whole grain cereal without the extra fruit. See breakfast suggestions on page 11.

Q: I cut out all carbohydrates and my blood glucoses were all within range. Should I continue?

A: No. We do not recommend cutting carbohydrates out of meals to help blood glucose levels. Carbohydrate is important for energy.

Q: I started on insulin. Does this mean I can eat whatever I want?

A: We still recommend a healthy balanced diet for people taking insulin. It is important for you and your babies health.

Insulin injections and diet

If your diabetes midwife or doctor has started you on insulin injections the following points are important to consider:

- Try not to miss meals, aim for three regular meals a day and a small snack between if needed.
- If you take a mealtime insulin such as Humalog or Novo rapid insulin remember this works with the carbohydrate part of your meal. If you do not eat a carbohydrate (e.g. bread/rice/pasta/fruits), or you miss a meal you also miss the meal injection.
- If your blood glucose drops below 4mmol/l you should treat this with some quick absorbed glucose, for example 170ml–220ml Lucozade or four jelly babies. Re-check your blood glucose 15 minutes later to ensure your levels are 4mmol/l or above then eat something with carbohydrate (e.g. piece of fruit or sandwich or meal).
- Different meal sizes of carbohydrate may require different amounts of rapid insulin, sometimes it is easier to aim for similar portion sizes

on a day to day basis or be given different amounts of insulin to take with different sized meals. Ask to see a dietitian in clinic to help advise you on this.

Future pregnancy planning clinics

If you are planning to become pregnant again in the future speak to your GP or diabetes care team who will refer you to the pre-conception clinic. In this clinic you will see a diabetes consultant, specialist diabetes nurse or midwife and a dietitian. An individual care plan will be made to help optimise your diabetes control for safer conception. Some diabetes medications are not safe in pregnancy so must be stopped safely by the doctor in the clinic before conceiving. If you think you are pregnant tell your GP immediately.

Please use the spaces on pages 25–27 to write down any questions you may have and bring this with you to your next appointment.

Further information

Diabetes UK website: <https://www.diabetes.org.uk/Diabetes-the-basics/Gestational-diabetes/>

NHS UK: <http://www.nhs.uk/conditions/pregnancy-and-baby/pages/foods-to-avoid-pregnant.aspx#close>

References

- NICE guidance on: Diabetes in pregnancy: management from preconception to the postnatal period <https://www.nice.org.uk/guidance/ng3/chapter/1-Recommendations#antenatal-care-for-women-with-diabetes-2>
- <https://www.nice.org.uk/guidance/ph27/chapter/1-Recommendations#recommendation-2-pregnant-women>
- <https://www.acog.org/Clinical-Guidance-and-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Weight-Gain-During-Pregnancy>
- Diabetes UK 2018 Nutrition working group Evidence based nutrition guidelines for the prevention and management of diabetes March 2018
- NHS - Healthy Weight: <https://www.nhs.uk/live-well/healthy-weight/height-weightchart/>

This information has been made for Heartlands Hospital, Solihull Hospital and Good Hope Hospital, which are all part of University Hospitals Birmingham NHS Foundation Trust.

If you have any questions, please contact the diabetes dietitians or nutrition and dietetic services on 0121 424 3146.

My Diet and exercise plan

Breakfast	
Lunch	
Evening meal	
Snacks	
Exercise	

Heartlands Hospital
Bordesley Green East
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B9 5SS
Tel: 0121 424 2673

Solihull Hospital
Lode Lane
West Midland
B9 2JL
Tel : 0121 424 5127

Good Hope Hospital
Rectory Road
Sutton Coldfield
West Midlands
B75 7RR
Tel: 0121 424 7768



The Trust provides free monthly health talks on a variety of medical conditions and treatments. For more information visit www.uhb.nhs.uk/health-talks.htm or call 0121 371 4323.

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