NHS
Royal Free London
NHS Foundation Trust

Type 2 diabetes and pregnancy

Information for patients

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Contents

This booklet aims to tell you what care to expect during and after your pregnancy when you have diabetes. It will not answer every question you may have, so please write any concerns down and ask your midwife or doctor.

We run a joint antenatal and diabetes clinic at Barnet Hospital and the Royal Free Hospital.

We have a dedicated multidisciplinary team who will review you on a regular basis to provide advice and support throughout your pregnancy. The team consists of a consultant endocrinologist, obstetrician, diabetes specialist midwife, diabetes specialist nurse and a diabetes specialist dietitian.

How will diabetes affect my pregnancy?

With good pre-conception care and good diabetes control there is every chance of a successful pregnancy. As soon as your pregnancy is confirmed, you should attend the joint diabetes antenatal clinic. Here you will receive support and advice to enable you to obtain and maintain good control of your diabetes as early in your pregnancy as possible.

By achieving and maintaining good blood glucose levels throughout your pregnancy, you will reduce the chance of developing complications and increase the ability of your baby to grow and develop normally.

How will diabetes affect my baby?

Your baby will not be born with diabetes. However, if uncontrolled, high levels of glucose in your blood will cross the placenta and get into the baby's blood; this will stimulate your baby to make more insulin to bring its glucose levels down. As insulin stimulates growth as well as controlling blood glucose levels, the baby may grow larger than normal, which in turn can make delivery more difficult and stressful.

High blood glucose levels may also affect how efficiently the placenta works and so can sometimes lead to smaller babies. Establishing good blood glucose control before conception and continuing this throughout pregnancy will reduce the risk of miscarriage, congenital malformation, stillbirth and neonatal death.

My antenatal care

Appointments

You will be offered an appointment in the joint diabetes antenatal clinic approximately every fortnight. At each clinic visit, you will have your blood pressure checked and your urine tested as part of the assessment of both your health and that of your developing baby. The type of clinician you see will depend on the stage you are at with your pregnancy and your blood glucose control. You will have contact with the diabetes and obstetric doctors, diabetes nurse, diabetes midwife and diabetes dietitian as appropriate.

Blood and urine tests

A blood test to estimate your HbA1c (blood glucose levels) will be taken in early pregnancy, as well as the routine blood tests. This measures your average diabetic control over a two-to-three-month period and assists the diabetes team to plan your care. Your kidney function will also be assessed if this has not been done in the last 12 months by a blood and a urine test.

Antenatal screening

If you are interested in finding out about specific antenatal screening tests available, discuss this with your doctor or midwife.

Retinal (eye) screening

Retinal screening will be offered at least twice in your pregnancy to monitor the health of your eyes.

Blood glucose testing

You will need to monitor your blood glucose levels regularly. Your diabetes specialist midwife or nurse will discuss this with you and give you a blood glucose monitor if you do not have one already. The aim will be to keep your blood glucose levels as follows:

Fasting or before meals: Between 3.5-5.3 mmol/l
One hour after meals: Less than 7.8 mmol/l

Diet

Your diabetes specialist dietitian will give you advice to help you to maintain a healthy diet and to control your blood glucose levels. Please see pages 15-29 for information on nutrition and related issues.

Medication

If your diabetes is normally controlled by diet, you are likely to need to take metformin or insulin or possibly both as your pregnancy progresses. This is due to increasing insulin resistance caused by hormones from the growing placenta which causes your blood sugars to increase.

- Metformin tablets – these help to reduce insulin resistance. Please see page 33 for information on starting metformin.

- Insulin injections–If you require insulin you will be advised and supported on how to take insulin by the diabetes nurse.

The aim of keeping your blood glucose within target levels is to optimise the outcomes for both you and your baby.

Ultrasound scans

An early ultrasound scan will be offered to confirm and date your pregnancy.

At around 20 weeks gestation you will be offered an anomaly scan – this is a scan to look at the physical development of the baby.

You will also be offered a foetal cardiac scan, which is a detailed scan of the baby's heart. This will be done at University College Hospital in London, where the specialist scan is available.

From about 28 weeks gestation you will be advised to have an ultrasound scan to measure the growth of your baby and the amount of fluid around the baby every four weeks.

Hypoglycaemia

In early pregnancy there is an increased risk of becoming hypoglycaemic. Hypoglycaemia means ‘low blood glucose levels’ – less than 3.5mmol/l. This is too low to provide enough energy for your body’s activities.

Signs of hypoglycaemia

Everyone experiences different symptoms, but common ones include:

- sweating
- dizziness
- headache
- tingly hands, feet, lips and tongue
- trembling
- hunger
- feeling tearful, stroppy, anxious, irritable
- palpitations
- impaired/blurred vision
- feeling weak/tired.

Treatment for hypoglycaemia

Mild/moderate hypoglycaemia	Severe hypoglycaemia
If you are able to, take 15-20g of quick acting carbohydrate: • four-six dextrose tablets • two tubes of Dextrogel • four to six lumps of sugar • 170-220ml Lucozade Energy (new formula of 8.9g per 100ml). Avoid Lucozade Zero. • four-five teaspoons of sugar • 200ml orange juice **Followed by:** • a good snack eg. two digestive biscuits/crackers or a piece of fruit OR • eat your next meal early	Your friends/family may need to help you and need to know how to: **If conscious:** • Give a sugary drink or honey – this may need to be poured into your mouth if you don't recognise your symptoms and are reluctant to be treated. **If unconscious:** • Call an ambulance. • Give an injection of glucagon which will raise your blood glucose. • Glucagon only lasts for a short time so when conscious you must have a sweet drink to stop the hypo returning.

Recheck your blood glucose after 10-15 minutes – it should be above 4 mmol/l.	• Continue with small amounts of sweet drinks until well enough to eat. • Check blood glucose level.

Planning for your birth

Towards the end of your pregnancy, you will need to plan when and how your will give birth to your baby with your doctors. Your medical history, and the size and position of the baby, will all need to be considered. Ideally the aim is for you to have a normal vaginal delivery. This is recommended from 38 completed weeks of pregnancy (occasionally earlier) and often induction of labour is advised.

Vaginal delivery

If the plan is for a vaginal delivery, you will be advised to phone the delivery suite when you think you are in labour. It will be necessary to control your blood glucose levels carefully throughout your labour, and this is usually achieved by anintravenous glucose and insulin infusion. The insulin dose will be adjusted according to the results of hourly blood glucose monitoring. The aim will be to keep your blood glucose levels between 4-7 mmol/l.

During your labour it is recommended that the baby's heart rate is monitored continuously, so that any potential complications can be detected quickly. High or low blood glucose levels can affect the baby's heart rate.

If your labour is to be induced, the procedure will be explained and you will be given a date and time to go in to hospital. You will continue your usual insulin and blood glucose monitoring regime until you are in

established labour. However if any of the following occur, the glucose and insulin infusions as described above may be commenced earlier:

- if you have any sickness
- if your blood glucose is persistently over 7.8 mmol/l
- if you are having problems with hypoglycaemia.

Caesarean section

If the plan is for a caesarean section, you will be given a date and time to go into hospital. Do not take your breakfast dose of soluble insulin as you will not be able to eat or drink after midnight.

It will be necessary to control your blood glucose levels carefully, and this will be achieved by anintravenous glucose and insulin infusion. The insulin dose will be adjusted according to the results of hourly blood glucose monitoring.

The aim will be to keep your blood glucose levels between 4-7 mmol/l. Your baby's heart rate will be monitored after this has been started, before you go to the operating theatre.

Once your baby is born your insulin requirements should return quickly to pre-pregnancy levels. The intravenous glucose and insulin infusions will be reduced or discontinued as appropriate, taking in to account when you are next able to eat.

You should continue to monitor your blood glucose pre-meals and at bedtime unless told otherwise. It is normal for levels to rise a little following delivery due to circulating glucose from the intravenous infusion. These will soon return to normal without the need for extra insulin.

After your baby is born

You will be advised to stay in hospital for 24 hours after the birth to ensure your baby maintains normal blood glucose levels and is feeding well. Your baby will stay with you unless extra neonatal support is required.

Your baby's blood glucose levels may drop after they are born as during your pregnancy, baby will have been producing their own insulin at a rate to match the glucose received from you. Once born, the baby needs to regulate their insulin production to that appropriate for the food it receives.

You should feed your baby within 30 minutes of birth, and then every two to three hours for the first 24 hours until its blood glucose levels are stable.

Your baby's blood glucose level will be monitored before the second feed at two to four hours after birth and following this if necessary.

It has been shown that among other benefits, breastfeeding reduces the chances of your baby becoming obese and/or developing diabetes in later life.

You will be encouraged with breastfeeding; however you will be supported with whichever feeding method you choose. Supplementary feeds and/or intravenous glucose may be required until the blood glucose levels become stable. If your baby is admitted to the neonatal unit, you will be encouraged to carry out as much of your baby's care as you are able to.

Please turn to page 35 for further information on breastfeeding and diabetes.

Postnatal follow-up

You should be seen two to three months after your baby is born, either by your GP or in the diabetes clinic, to ensure your diabetes control is reviewed.

Please contact the diabetes nurses or your GP before this if you have any concerns.

Nutrition and related issues

Diet and lifestyle

Healthy eating and regular exercise are an important part of the management of diabetes in pregnancy because they help to:

- control blood glucose levels
- supply the baby's growing needs
- achieve a healthy weight gain in pregnancy.

This section of the booklet provides information on how to improve your diet. You will be seen by a diabetes specialist dietitian to support you with your changes and answer any further questions you may have.

Controlling your blood glucose levels with diet

To help control blood glucose levels with diet, you should:

1. Eat regular meals

Have at least three meals a day and snacks at regular intervals. This will help to prevent excessive changes or fluctuations in your blood glucose levels.

Snacks are not essential to maintain blood glucose levels but are encouraged. They can help spread your intake across the day and stop you feeling hungry. You are encouraged not to leave very large gaps in between mealtimes as this can often result in bigger meals and

hypoglycaemia. Please see the ‘suitable snacks’ section for snack ideas on page 29.

Please be aware your waking blood glucose level can be affected by late night meals or mid-night snacking.

If you have a small appetite, are nauseous or are suffering from heartburn, you may find keeping to smaller more frequent meals more comfortable. Speak to your diabetes nurse or diabetes dietitian who will support you on how to take your medication.

2. Be carbohydrate aware

All carbohydrates are converted to glucose by the process of digestion and enter the bloodstream as glucose. The larger the portion, the more your blood glucose will rise. You will be advised to:

- eat less carbohydrate if your intake is high
- choose better types of carbohydrates
- spread carbohydrates throughout the day
- pair your carbohydrates with a source of protein.

Carbohydrates include both starch and sugar:

- **Cereal starch,** eg breakfast cereals, bread, rice, pasta, chapati/roti, paratha, dosa, millet, semolina, maize, oats, rye, couscous, flour etc.
- **Vegetable starch,** eg potatoes, yam, sweet potatoes, plantain, cassava, gari, fufu, banku, kenkey, other root vegetables, beans and pulses.

- **Natural sugar** in fruit and fruit juices, milk and milk products, eg yoghurt, mousse, custard and ice cream, etc.
- **Added sugar** such as sugar, honey, jaggery, sweets, drinks, chocolate, biscuits, cakes, desserts and jams, etc.

By choosing carbohydrates that are slow releasing, your blood glucose levels will rise more slowly and are therefore more likely to be within target. Try choosing foods such as:

- rye, granary or multi-seeded breads
- oat-based or wholegrain cereals
- wholegrain/brown or basmati rice
- chapattis or roti made with wholemeal or medium flour
- sweet potato, new potatoes or potatoes with their skins
- wholemeal pasta
- yam (not pounded)
- cassava (not pounded)
- coarse couscous or cracked bulgur wheat
- unripe, green or ‘black’ plantain.

But remember the larger the portion the more the blood glucose will rise. This may mean increasing medication unnecessarily.

3. Fruit and vegetables

Eat at least five servings of fruit and vegetables per day. They contain valuable vitamins and minerals such as vitamin C and folic acid required for pregnancy.
A portion of fruit or vegetables is:

- one piece of fruit eg. a medium size apple or a small banana
- one slice of large fruit eg. watermelon, melon, two rings of pineapple
- two small fruits eg. satsumas, nectarines, plums
- a cupful of berries
- one tablespoon of dried fruit
- three tablespoons of vegetables
- one small bowl of salad.

Try and make your vegetables the biggest portion on your plate. They will keep you full without raising your blood glucose levels.

4. Limit foods high in sugar

Eating foods which are high in sugar such as jam, marmalade, honey, sweets, chocolates, cakes, sweet biscuits, jaggery, barfi, kheer, gulabjamun, halva, jalebi and sweet pickles, will make your blood glucose levels rise very quickly and out of target.

Excess sugar can also contribute to you gaining excess weight. Sugar is ‘empty calories’ and provides no nutritional benefit to you or your baby.

Try to avoid the following:

- adding sugar, jiggery(gur), honey or glucose to food and drinks
- fizzy drinks, high juice squashes, fruit juice and energy drinks containing sugar
- syrup, honey, treacle, jams, marmalade, dextrose, fructose, maltose, corn and glucose syrup found in processed foods.

Be aware of other names for sugar on the food label: sucrose, glucose, dextrose, fructose, lactose, maltose, honey, invert sugar, syrup, corn sweetener and molasses.

If you are missing your treats consider making your own and experimenting using less sugar.

If you need to sweeten drinks and foods, try using an artificial sweetener. These are safe to use during pregnancy in reasonable amounts.

5. Protein foods

Protein foods are important for the growth and development of your baby and your own health. On their own they have very little effect on blood glucose levels. This makes them a good food group to pair with carbohydrate foods as they can slow the release of glucose into your blood eg. having an egg with your toast in the morning. They can also help to fill you up.

Include **at least two servings daily** of lean chicken, fish, meat, eggs or cheese, beans, pulses, lentils, nuts and seeds.

Fish is good for your health and the development of your baby, so it's good to eat it regularly. The general recommendation is to eat at least two portions (one portion is about 140g) per week, including one or two portions of oily fish, eg. mackerel, sardines, salmon, herrings, trout or pilchards. Oily fish is also beneficial for heart health, but don't have more than two portions a week.

Avoid fish which tend to have higher levels of mercury, eg swordfish, shark and marlin. Try to limit the amount of tuna you eat, which can also have relatively high amounts of mercury, to up to four medium-sized cans or two tuna steaks a week. It's also advisable to avoid raw shellfish to reduce the risk of food poisoning, which can be particularly unpleasant during pregnancy.

Fluid intake

Try to **drink at least eight glasses of fluids each day** – predominately water or with 'no added sugar' squashes, diet drinks, herbal teas, low calorie hot chocolate drinks and semi-skimmed milk being good alternative choices.

Alcohol

A baby's liver is one of the last organs to develop fully and does not mature until the last half of pregnancy.

Your baby cannot process alcohol as well as you can and too much exposure to alcohol can seriously affect your baby's development especially in the first trimester. The safest option is not to drink at all when pregnant.

For pregnant women, getting drunk or binge drinking (drinking more than 7.5 units of alcohol on a single occasion) can be harmful to your baby. So, if you choose to drink alcohol during pregnancy, it is advisable to stick to a maximum of one to two units once or twice a week. Alcohol can also make hypoglycaemia (hypos) more likely if you treat your diabetes with insulin.

Caffeine

It is best not to have more than 200mg of caffeine a day, eg:

- one mug of instant coffee = 100mg
- one mug of filter coffee = 140mg
- one mug of tea = 75mg
- one can of cola = 40mg.

Fat in foods

A small amount of fat is essential to provide us with important vitamins. Although fat does not directly influence your blood glucose levels eating in excess will contribute to you gaining weight.

Try to minimise your fat intake through the following:

- Use low fat cooking methods such as dry frying, steaming, baking, grilling and poaching.

- Use lean cuts of meat, trim the fats off meat and remove the skin from poultry. Use alternatives such as beans, pulses, peas and lentils.
- Try reduced fat and low fat spreads, especially those made from sunflower/olive oils and fat-free or low-fat salad dressings, mayonnaises and sauces.
- Use low fat dairy products, such as semi-skimmed milk.
- Cut down on snack foods such as biscuits, crisps, pastries, cakes and Indian savouries such as Bombay mix.
- In place of takeaways choose low-fat sandwiches, lean meat kebabs, grilled/baked fish and low fat chips.

Calcium

Calcium is essential for keeping yours and your baby's bones and teeth healthy.

Good sources of calcium are:

- 25g (1oz) cheese
- one small pot of yoghurt
- 200mls (one third of a pint) of skimmed or semi-skimmed milk
- green leafy vegetables such as broccoli, cabbage and okra
- soya beans
- tofu

- unsweetened milk alternatives with added calcium, such as soya, rice or oat milk
- fish where you eat the bones such as sardines and pilchards.

Iron

Iron is an essential mineral, with several important roles, for example it helps to make red blood cells, which carry oxygen around the body. Good sources of iron are:

- lean meat
- lentils
- soybean flour
- green leafy vegetables such as watercress and curly kale
- eggs
- beans
- nuts
- dried fruit such as apricots (one tbsp)
- wholegrains such as brown rice.

If your iron level is low, this can make you feel very tired and may lead to anaemia. If the iron level in your blood becomes low, your GP or midwife will advise you to take iron supplements. These are available as tablets or a liquid.

Vitamin C can help your body absorb iron. Your iron tablets can be taken with good sources of vitamin C such as a small orange, a handful of strawberries and blackcurrants, or red and green peppers, broccoli, Brussels sprouts and potatoes.

Folic acid and diabetes

Women with diabetes who are planning to become pregnant are advised to take folic acid (5mg/day) until 12 weeks of pregnancy to reduce the risk of having a baby with a neural tube defect. This dose can be prescribed by your doctor.

Diabetic products

Diabetic products such as chocolates and biscuits are not recommended. They are often high in fat, expensive and can cause a laxative effect.

Symptoms in pregnancy

The following tips will help to ease these common symptoms in pregnancy:

Nausea and vomiting

- Eat small, regular carbohydrate based meals, eg dry bread, crackers, cereal, plain potato, rice and pasta.
- Drink fluids between rather than with meals.
- Avoid fatty and highly spiced meals and snacks.
- Keep rooms well ventilated to reduce strong odours, eg cigarette smoke, and take plenty of fresh air.
- Cold rather than hot foods may be better tolerated.
- Ginger in food and sugar-free drinks may help to alleviate nausea.

Heartburn

- Eat small, regular meals.
- Avoid fatty, spicy, acidic foods and fizzy drinks.
- Having milk and yoghurt may ease burning pain.
- Avoid lying down after meals.
- Elevate your head with pillows when sleeping at night.

Constipation

- Ensure a good fluid intake of up to eight to ten glasses per day.
- Eat more high fibre cereal products, eg wholemeal/granary bread, wholemeal/granary flour and porridge.
- Have potatoes with their skin on.
- Increase your fruit and vegetable consumption (tinned, fresh, frozen and dried).Try mixing dried fruit with nuts or seeds.
- Include peas, beans, lentils and nuts in your diet.
- Gentle exercise can also encourage a healthy bowel.

How much weight should I expect to put on?

The average weight gain during pregnancy (starting from a healthy pre-pregnancy weight) is 10-12kg (one and a half to two stone). A large weight gain can make it more difficult to control your blood glucose. Keeping active and reducing your intake of fatty and sugary foods will help.

Pregnancy is not the time to try drastic methods to lose weight. If you were overweight at the start of your pregnancy you may find the dietary changes you made will mean your weight increases more slowly or stays the same due to healthier eating. Your weight will be monitored when you attend the clinic.

Being pregnant can be a positive motivator for improving your diet. These changes mean you are eating not for two, but now eating twice as well.

Be physically active every day

Regular gentle physical activity such as walking, or swimming helps to keep you fit and controls your weight. It will also help to improve your blood glucose levels and the affects can last for several hours after the exercise.

Choose an activity you enjoy and aim to be more active in your day. A simple activity such as a walk at lunchtime can have positive effects.

If in doubt as to how much activity you can do, ask your midwife or doctor for advice when you attend the clinic.

Portion guidance and meal planning

Breakfast

- one bowl of porridge (30g of dry rolled oats) with 150mls semi-skimmed milk. Sprinkle with cinnamon; or
- one to two slices of granary or seeded toast with a topping such as boiled, poached or scrambled egg, a slice of meat, Marmite, mushrooms, tomatoes or cheese.

Lunch

- a sandwich or roll (granary/seeded bread) with lean meat, egg, tinned fish, cottage cheese or cheddar cheese; or
- two to three wholegrain crispbreads with vegetables and salad, cottage cheese or cheese spread; or
- one to two slices of granary or seeded toast with an omelette; or
- small jacket potato with vegetables and beans, cheese or tuna; or
- a medium wholemeal pitta bread with chicken or houmous and salad; or
- one thin, hand-sized chapatti with dhal and vegetables; or
- soup with one or two slices of granary bread or two to three wholegrain crispbreads; or

- a large salad with meat, fish, cheese or nuts and seeds with either one to two tablespoons of couscous, pasta, rice or two egg-sized potatoes or one slice of bread or two to three crispbreads.

Main meal

- roasted or grilled meat with vegetables with two to three egg-sized new potatoes; or
- a small portion of pasta (approximately 75g uncooked/180g cooked) with meat, homemade tomato or cream sauce and salad or vegetables; or
- vegetable, meat or fish curry or stew with a small portion of brown rice (approximately 80g uncooked/180g cooked) and vegetables; or
- casserole with meat, vegetables, and pulses and two to three egg-sized potatoes; or
- curry with two thin hand-sized chapattis.

Desserts

- one portion of fresh fruit or half a tin of fruit in natural juice; or
- 125g of low fat yoghurt; or
- sugar free jelly; or
- no added sugar instant whip; or
- 40g dark chocolate (70% cocoa).

Suitable snacks

Although it is not essential to snack if you have diabetes there may be times when you want to, for example, when feeling a bit peckish, nauseated, to prevent hypoglycaemia (patients on insulin only) or during labour.

Below are some snack ideas:

One piece of fruit	**One bowl of salad**
One oat/nut based cereal bar	**Two rice cakes**
Two tbsp dry cereal	**Two to three tbsp pretzels**
One tbsp dried fruit	**One cup of plain popcorn**
One small slice of malt loaf	**One glass of semi-skimmed milk**
One pot of low fat yoghurt	**Nuts**
Two wholegrain crackers with low fat cheese spread and/or a slice of meat	**One slice of granary bread with marmite/ sliced meat**
Vegetable sticks and houmous	**Olives**
Two oat biscuits	**Handful of seeds**

Additional information

The information provided in this section of the booklet targets specific issues with diabetes in pregnancy.

This should be read in conjunction with the ‘Have a healthy diet in pregnancy’ leaflet which is available on the NHS Choices website. This guide will provide further information on nutrition, food safety and hygiene and breastfeeding and can be accessed here: www.nhs.uk/conditions/pregnancy-and-baby/pages/healthy-pregnancy-diet.aspx

Why is my blood glucose level high?

1. **Was my carbohydrate portion bigger than normal?**
   Did I eat a bigger portion of carbohydrate? Have I had multiple carbohydrate sources, for example a sandwich, fruit and yoghurt? All of these foods contain carbohydrates and individually will not raise levels, but together they may make a bigger portion.

2. **Did I choose the most slow-releasing carbohydrate?**
   Quick fixes include choosing porridge over Weetabix or seeded bread over wholemeal bread.

3. **Did I have a source of protein with my carbohydrate?**
   Having protein with your carbohydrate food will slow down the release of glucose and will also fill you up, eg have meat, fish or beans with your pasta rather than pasta alone, or an egg with your toast rather than toast alone.

4. **Have I been less active today?**
   If you're normally an active person you may see a rise in your blood glucose levels when you are less active. A quick walk, using the stairs or cleaning up after dinner is enough to improve your blood glucose levels.

5. **Why is my fasting level raised?**
   Did I eat late? Did I have a midnight snack? Late meals or snacks can affect your waking blood glucose levels.

6. **Why is my blood glucose level high after breakfast?**
   In the morning your body is at its most resistant to insulin. Therefore, you may need to reduce your carbohydrate portion and introduce a protein source.

   For example instead of having two slices of toast, consider having one slice of toast and an egg. If you are still hungry have a mid-morning snack or split your breakfast into two portions and have the second half of your breakfast when you feel hungry.

   Your blood glucose will rise as your pregnancy progresses due to your hormones making you more resistant to your body's own insulin and the insulin you inject. Your team will be there to support you with keeping your blood glucose levels within target.

How to start metformin

Metformin is prescribed to pregnant women with diabetes when dietary changes do not achieve the recommended blood glucose levels. If you have been advised to start metformin, please also continue with the dietary changes you have made.

Start by taking one tablet (500mg) with your breakfast and one tablet with your evening meal.

If no side effects occur, after three days increase to taking two tablets (1000mg) with your breakfast and two tablets with your evening meal.

Metformin can cause abdominal side effects for some women, eg nausea, wind and diarrhoea. The chance of these side effects occurring can be reduced by taking the tablets with food and increasing the dose slowly. Always take in the middle of a meal and never on an empty stomach.

If you start to experience significant side effects after a dose increase, cut back to the previous dose and continue with this – **do not stop all together without discussing this with your doctor or nurse**.

By taking a slow-release preparation of metformin (eg Glucophage SR) it has been shown to reduce side effects on your body.

Metformin is unlicensed for use in pregnancy (as are many medications). However, trial experience suggests that it is safe for the baby, and its use is recommended by national guidelines (NICE 2015).

If you have any questions on literature advising against the use of metformin in pregnancy, please contact the diabetes team.

Insulin

You may already be on insulin or could need to start insulin to control your blood glucose levels.

If you are new to taking insulin, you will be taught and supported by our diabetes nurse on how to take it, how often and how much.

You will all be reviewed regularly in clinic to support you with this medication through the changes that arise as the weeks pass in your pregnancy.

Breastfeeding and diabetes

This section aims to address information on how diabetes may affect breastfeeding. It may not answer every question you have, so please write any concerns down and discuss these with your midwife.

This information should be read in conjunction with the UNICEF leaflet ‘Off to the best start’. This leaflet can be provided by your midwife or downloaded here: www.unicef.org.uk/babyfriendly/baby-friendly-resources/breastfeeding-resources/off-to-the-best-start.

Can I breastfeed if I have diabetes?

Yes, breastfeeding is especially recommended if you have diabetes.

What are the advantages to breastfeeding?

Breastfeeding has many health benefits for both you and your baby. It is recommended that to maximise these affects you should breastfeed for at least the first six months, but the longer the better.

Research has shown that for baby there is less likelihood of developing:

- diabetes in childhood
- tummy upsets
- ear infections
- chest infections
- eczema
- asthma

- cancer
- type 1 diabetes

Colostrum (first breast milk produced from late in pregnancy) helps to stabilise the baby's blood glucose levels in the initial hours following birth.

Research has shown that for mothers, benefits of breastfeeding include:

- A tendency to lose the weight gained in pregnancy more quickly than mothers who formula feed.
- The womb shrinking back to a normal size more quickly.
- A lower risk of breast cancer and some forms of ovarian cancer.

What can I do to prepare for breastfeeding?

Express colostrum

Colostrum is the first yellow coloured milk that mothers produce for their baby after birth, sometimes referred to as 'liquid gold'. It is rich in antibodies and high in protein, vitamins and minerals. Even one feed of colostrum is valuable for mother and baby health.

Some mothers find that they leak colostrum while they are pregnant. This does not affect the milk supply after the baby is born.

You may wish to consider hand expressing colostrum before the birth of your baby. This can be done from 37

weeks of pregnancy. Colostrum collected before the birth of your baby can be stored in the freezer safely for up to three months.

If you would like further information, please speak to your midwife or leave a message for the infant feeding team who will call you back:

Barnet Hospital: 020 8216 5141
Royal Free Hospital: 020 3758 2000 ext 36169

Remember to bring any expressed colostrum with you when you come into hospital for the birth. Please ensure this is labelled with your details. This can be stored and then defrosted for use after your baby is born if required.

More information about breastfeeding

As a UNICEF fully accredited baby friendly trust we aim to support and encourage mothers with their preferred feeding method of their baby in a loving, safe and responsive way. More information about feeding your baby is available on our website: www.royalfree.nhs.uk/services/services-a-z/maternity-services/feeding-your-baby

What happens once my baby is born?

It is very important that your baby has skin-to-skin contact with you as soon as possible after the birth. This helps your baby to keep warm and feed early.

Why is an early feed important?

When the mother's blood glucose levels are increased during pregnancy the baby may have a temporary lowering of its blood glucose levels after the birth. This is because the baby may have been triggered to make higher levels of insulin which can last for 24-48 hours.

It is therefore especially important that your baby has skin-to-skin contact and a feed soon after they are born, **ideally within 30 minutes**. This will help to stabilise and maintain your baby's blood glucose levels and help keep them warm.

What happens if my baby does not want to feed right away?

Not every baby is interested in feeding straight after being born. If help is required, we will assist you to hand express some colostrum if you have not done this prior to giving birth. The colostrum can be given by cup, pipette or syringe instead.

How often should I feed my baby?

During the first few days, your baby will need feeding every two to three hours unless they wake to feed earlier.

How will I know if my baby's blood glucose level is okay?

Whenever a mother has diabetes in pregnancy, we take a blood sample from the baby's heel at about four hours of age. This is normally before the second feed.

If your baby's blood glucose levels are low (below 2.5mmol/l) before the feed, we will need to take another measurement after feeding to ensure the levels have risen. If the level stays low, we may recommend giving expressed milk and/or formula milk from a cup. This is usually a temporary measure.

Once your baby's blood glucose levels have stabilised we will stop measuring them. It is important to continue to feed your baby regularly, ensuring your baby feeds around eight times in a 24 hour period. Please see the 'Off to the best start' leaflet for further information.

Introducing solids

This is not recommended before the baby is six months old.

Diabetes control and breastfeeding for those on medication

You may need to make alterations to your diet and insulin/medication doses to compensate for alterations in your milk production.

Initially you will need to increase your carbohydrate intake by about 50g daily (five portions) spread over the day, and make sure that you have an adequate supply nearby when you are feeding (see ‘suitable snacks’ on page 29). If you test your blood glucose prior to and after a few feeds you will establish the drop expected in your blood glucose levels. It may be necessary to reduce your insulin dose for this period. It is also important to maintain an adequate fluid intake.

If you have any concerns, please speak with your diabetes specialist nurse or diabetes specialist dietitian who would be happy to support and guide you.

Remember to take your insulin/medication when it is due, and to have adequate extra carbohydrates with you in case your blood glucose becomes too low.

For the future

If you are likely to plan a further pregnancy, please speak to your diabetes doctor or nurse before you become pregnant so that you can optimise the outcome for you and your baby.

Advice from the NHS is that:

"Effective care before pregnancy improves pregnancy outcomes in women with diabetes."

So, let's be **SAFER**:

Stop	Think ahead.
A1c	Is your HbA1c (blood glucose) on target?
Folic acid	You should take 5mg folic acid, prescribed by your doctor, from about three months before you become pregnant.
Enjoy	Enjoy planning your pregnancy and giving your baby a healthy start.
Referral	Early referral to specialist care when pregnant.

Further questions and notes

During this time there can be a lot of information and changes to take on in a short space of time. We understand this can be overwhelming at times. Please rest assured you are not alone and will be attending regular appointments with our joint diabetes antenatal team to support you through your pregnancy.

We are all here to help answer any questions or concerns you have along the way. You may find it helpful to write these down ready for your appointments with us.

Notes:

References and useful links

- **Diabetes UK: What is gestational diabetes?:** www.diabetes.org.uk/diabetes-the-basics/gestational-diabetes

- **NICE GUIDANCE (NG3) Diabetes in pregnancy: Management from preconception to the postnatal period**: www.nice.org.uk/guidance/ng3

- **UNICEF 'Off to the best start' leaflet:** www.unicef.org.uk/babyfriendly/baby-friendly-resources/breastfeeding-resources/off-to-the-best-start

For more information about the maternity or diabetes for adults services, please visit our website at:

- www.royalfree.nhs.uk/services/services-a-z/maternity-services
- www.royalfree.nhs.uk/services/services-a-z/diabetes-services-for-adults

If you have any feedback on this leaflet or require a full list of references for it, please email: rf.communications@nhs.net.

This leaflet is also available in large print. If you need this leaflet in another format – for example Braille, a language other than English or audio – please ask a member of staff.

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