Joint IMS Wolfson Diabetes & Endocrine Department with the Rosie Hospital (Maternity) Services

Gestational Diabetes

This booklet aims to explain what gestational diabetes (GDM) is, what this means for you and your pregnancy, how you can manage it and outline the care you will receive until your baby is born. Please discuss any aspect of your care with us at your clinic appointments.

The team that will look after you is made up of the obstetrician, physician (diabetes), diabetes midwife, diabetes specialist nurse and diabetes specialist dietitian.

What is GDM?

GDM is a condition that occurs in pregnancy when the body becomes less able to regulate the levels of sugar, called glucose, in the blood. Glucose levels can rise above normal.

It typically occurs during the second half of pregnancy although it can occur earlier and usually goes away once your baby is born (this will be confirmed with a test – see page 3).

Normally, the hormone insulin regulates blood glucose, within the normal range 3.5 – 7.8 mmol/L

During pregnancy the body becomes resistant to the action of insulin, so the body needs to produce more insulin to maintain blood glucose levels within the normal range.

GDM occurs when the body is unable to produce enough insulin to meet the extra needs of the pregnancy.

GDM more commonly occurs in women who are overweight, older, received some fertility treatment, have a family history of diabetes and/or have had a large baby in a previous pregnancy. It is also more common in some ethnic groups such as Asian and Afro-Caribbean populations.

Clinic visits:

This leaflet will give you the information you need to manage your GDM through diet and daily activity. You will also learn how to measure your blood glucose levels so that you can make sure your glucose levels stay in a healthy range.

The diabetes care team will see you every one to four weeks to give help and support. This clinic is held in the Ante Natal Clinic of the Rosie Maternity Hospital on a Tuesday afternoon. You may also have a growth scan and an appointment with the obstetric team on this day so please prepare to be at the hospital for some time.
How will GDM affect my pregnancy?

Most women do not feel any different or unwell with gestational diabetes, however some things will happen differently as a result of having gestational diabetes:

- You will need to be very careful with your diet throughout the rest of your pregnancy and during delivery – see page 4.
- We encourage you to keep active every day – see page 8.
- You will need to monitor your blood glucose levels four times a day – see page 8.
- We will offer you extra scans to monitor the growth of your baby – see page 9.
- You will be seen more frequently in the antenatal clinic. The diabetes team usually see you every two weeks to review your blood glucose levels and the obstetric team will see you after your scans.
- Having GDM means your baby will be born on the delivery unit where your labour can be monitored and the staff can meet any additional needs during the birth - see page 9.
- NICE (National Institute for Clinic Excellence) provide guidance on when your baby should be born depending on how your diabetes has been treated, growth of baby and blood glucose levels – see page 9
- After delivery you will need to remain in hospital for 24 hours for monitoring your and your baby’s glucose levels

What does having gestational diabetes mean for my baby?

Most women with GDM have a healthy baby born close to term, however, having GDM increases the risk of some complications; the two main ones are explained below and we will happily discuss these with you at your clinic appointments.

**Macrosomia – When the baby is affected by accelerated growth**
One of the major sources of food for your baby is the glucose in your blood. If your glucose levels run high these pass directly to you baby. This causes your baby to produce more insulin, lay down excess fat stores and grow bigger normally. Having a big baby increases the risk of complications during the birth such as shoulder dystocia and can influence when and how your baby is born. The growth of your baby will be monitored closely by extra scans, and we will discuss delivery choices with you towards the end of your pregnancy.

Increased insulin production and fat stores in the growing baby has been found to increase the risk of obesity and type 2 diabetes in your child’s future health.
Keeping your blood glucose levels in the normal range helps prevent these risks.

**Neonatal hypoglycemia – when the baby’s blood glucose levels fall too low after birth**
If your glucose levels are too high this passes to the baby causing their pancreas to produce more insulin than normal. When this happens towards the end of pregnancy the baby’s glucose levels can then fall too low after delivery and your baby may require extra support to maintain its own glucose levels in the first few days after birth.

The risk of this happening can be reduced by keeping your blood glucose levels well controlled right up to and during delivery and encouraging your baby to feed within the first hour of delivery. Your baby’s blood glucose levels will be checked four hours after delivery and then before feeds for 24 hours.

**So keeping your blood glucose levels in the normal range is important to allow your baby to grow at the correct rate and keep your baby’s blood glucose levels stable after delivery.**

**What does having GDM mean for me in the future?**

Once your baby is born the GDM should go away and this will be confirmed with a fasting glucose test six to eight weeks after delivery. If the result is normal we will write to inform you of this. If the result has remained high we will invite you back to clinic to discuss the result.

**Having had GDM means you are likely to develop GDM in any future pregnancy and more likely to develop type 2 diabetes.**

**Future pregnancies:** Because of the increased risk for developing GDM again it is suggested that you get in touch with the diabetes midwife and start testing your blood glucose levels after your dating scan.

- The guidance is to test blood glucose levels twice daily on three to four days each week; you can choose which days suit you but please include a weekend day.
- Vary the testing times to include a test first thing in morning or on waking and 1 hour after meals.
- Please contact the diabetes midwife if your glucose levels are rising above the normal range.
- We will routinely see you in clinic at 24 weeks for review.
- If you are overweight during your current pregnancy, losing weight before your next pregnancy will reduce your risk for developing GDM.

**Developing type 2 diabetes:** Research studies show that women who developed GDM have a 50-70% chance of developing type 2 diabetes in the future.

**Reducing your risk of developing type 2 diabetes**

- **Healthy weight:** If you are overweight reducing your weight to within a healthy range after your baby is born will significantly reduce your risk for developing type 2 diabetes. However, do not start a strict weight reducing diet during the pregnancy or whilst breast feeding. You can ask your GP to refer you to a dietitian or weight reducing program if you would find this helpful.
• **Physical activity** makes insulin work more effectively. Including some physical activity into your daily routine for 30 minutes will reduce the risk of developing diabetes. This needs to be additional to your normal daily activity and at a level that makes you breathe harder than normal; for example 30 minute brisk walk. This can be divided into smaller time slots if that fits into your routine better.

• **Eating a healthy diet** that is high in fibre, low in refined carbohydrate and saturated fat will help keep your weight in a healthy range. It also reduces the risk of developing type 2 diabetes.

• **Breast feeding:** Research shows that women with GDM who breast feed their babies delay the risk of developing type 2 diabetes.

### Dietary advice

Your blood glucose levels will be maintained within the normal range by eating the right diet and being physically active. Diet and activity are the first and often the only form of treatment required.

Below are the dietary guidelines you are advised to follow.

#### Carbohydrate foods

It is the carbohydrate foods that directly affect blood glucose levels and so is the main focus of the dietary treatment.

When carbohydrate foods are eaten they are digested and absorbed into the bloodstream as glucose, causing the blood glucose levels to rise. The body then produces just the right amount of insulin to cover this rise to prevent the glucose levels rising above the normal range.

Having developed gestational diabetes means you are now unable to produce large amounts of insulin and your insulin production may be more sluggish than usual.

To overcome this and keep your blood glucose levels in the normal range it is helpful to avoid large portions and refined types of carbohydrate in your diet – see below.

However a healthy balanced diet should contain some carbohydrate food with each meal and snack to provide energy, fibre, vitamins and minerals.

So it important to eat enough carbohydrate for a healthy diet but not too much to overload your insulin production.

**Carbohydrate foods include:** Potato, bread, rice, pasta, Yam, Cassava, noodles, couscous, breakfast cereals, crispbread, foods containing flour (cakes, biscuits, pastry, pizza) fruit, milk, yogurt, sweets, chocolate and sugar.

Types of carbohydrate to include in your diet and ones best avoided are listed below.

#### Carbohydrate portion:

The larger the portion of carbohydrate foods eaten, the higher the glucose levels rise and the more insulin the body needs to cover it. When you have GDM the body is not able to produce large amounts of insulin at any one time, so will not be able to cover large portions of carbohydrate foods.
An important part of the dietary management is to eat smaller amounts of carbohydrate and spread it out over the day.

Your dietitian will review your carbohydrate intake and suggest portion sizes for carbohydrate foods.

- You may be asked to eat smaller meals and have additional snacks in between meals so that you eat the same amount over the day but in smaller more frequent quantities. See section on suitable snacks.
- Avoid doubling up on carbohydrate foods in one meal, for example do not have bread **and** potatoes or bread **and** pasta together.
- It is important that some carbohydrates are included in each meal; they should not be avoided or overly limited to keep blood glucose down otherwise you may be hungry. The diet can also become deficient in important nutrients and energy, which can then lead to inadequate weight gain and possibly compromise your ability to breastfeed.

**Breakfast:** carbohydrate is often not well tolerated at breakfast and many women need to split what they would normally eat over breakfast and a mid morning snack e.g. 2 slices toast would become 1 slice toast at breakfast and 1 slice mid morning.

**Good breakfasts:**
- 1 slice wholemeal toast with a topping e.g. poached or scrambled eggs / mushrooms / tomato / cheese / ham
- Or: 1 small pot yoghurt with one portion chopped fruit or cup of berries
- Or: 25g jumbo porridge oats mixed with low fat crème fraiche and 1 cup berries
- Or: 40g Jumbo porridge oats made into porridge with water and single cream added to taste (may be sweetened with artificial sweetener)

This can then be repeated mid-morning or choose a snack from the list on page 6.

**Carbohydrate type:**

The following table lists the foods identified by pregnant women as being best avoided with suitable alternatives.

As a rule; the more processed the carbohydrate is the faster the rise in blood glucose levels and the harder it is to keep the 1 hour post meal glucose in the normal range.

High fibre, unrefined / unprocessed carbohydrates (low glycaemic Index) work best to keep blood glucose levels in target after meals.

Foods written in Italics in the “try instead” column are often not well tolerated in pregnancy and may also need to be avoided.
<table>
<thead>
<tr>
<th>Refined carbohydrates to avoid (High GI)</th>
<th>Try instead (Low GI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>White breads</strong>: sliced, rolls, pitta, naan, baguette, croissant, chapattis, panini.</td>
<td><strong>High fibre breads</strong>: Whole-wheat, granary and multi-grain varieties of breads. Oat enriched bread. Chapattis made with wholemeal flour. <strong>Freezing bread first can help lower the glucose response</strong></td>
</tr>
<tr>
<td><strong>White flour based foods</strong>: Cakes, biscuits, Cream crackers, water biscuits, Ritz, Tuc, Yorkshire pudding, dumplings, Pizza, Pastry – pies, pasties, quiche, sausage rolls, spring rolls. Breaded and battered foods, for example fish fingers, battered fish.</td>
<td>Oatcakes, whole-wheat crackers and crisp-bread, for example Ryvita, Cracker wheat. Digestives, Hobnobs, Hovis biscuits (one or two)</td>
</tr>
<tr>
<td><strong>Low fibre and sugar coated breakfast cereals</strong>: Cornflakes, Rice Krispies, Special K, Sugar Puffs, Cocoa Pops, sweetened muesli.</td>
<td><strong>High fibre cereals</strong>: Shredded Wheat, Weetabix Porridge oats (Jumbo)</td>
</tr>
<tr>
<td><strong>Rice, pasta, grains</strong>: No types need to be avoided.</td>
<td>The best rice is basmati. Brown rice and whole-wheat pasta may give benefit. <strong>Cooling rice, pasta and potato after cooking and then eating cold or re-heating fully can lower the glycaemic response</strong> Couscous, Bulgur wheat, semolina, tapioca, Quinoa</td>
</tr>
<tr>
<td><strong>Processed potato products</strong>: Oven chips, French Fries, Smiley faces, waffles, Croquettes, frozen roast potatoes, instant potato, ready meals with instant potato topping for example Shepherds Pie.</td>
<td>Home cooked potatoes – boiled is best <strong>Small baked potato, mash</strong> Sweet potato, yam, cassava</td>
</tr>
<tr>
<td><strong>Processed savoury snacks</strong>: Hula Hoops, Quavers, Pringles, Monster Munch, French Fries, Skips, baked crisps</td>
<td>Sliced potato crisps, for example Walker’s or Kettle crisps. Ryvita snacks Vegetable crisps Salted or natural popcorn</td>
</tr>
<tr>
<td><strong>Cold drinks</strong>: Fruit juices and smoothies, full sugar squash and fizzy drinks. Lucozade.</td>
<td>Sugar free squash, Sugar free carbonated drinks. Water.</td>
</tr>
<tr>
<td><strong>Sugar</strong>: Sugar, glucose, maltose, dextrose, honey, treacle and syrup</td>
<td>Artificial sweeteners if a variety are used and in small quantities Splenda, Sweetex, Hermesetas, Nutrasweet, Candarel, Stevia</td>
</tr>
<tr>
<td><strong>Preserves</strong>: Jam, marmalade, Honey, Lemon curd, maple syrup, chocolate spread</td>
<td>Marmite, Vegemite, Peanut Butter (if no allergies)</td>
</tr>
</tbody>
</table>
Sweets / Desserts: Melon, Mango, Pineapple, dried fruit sweets, chocolates, mints Sweet puddings and Ice cream, Tinned fruit in syrup

Fresh fruit, tinned fruit in natural juice (juice drained off), Sugar free Jelly. Yogurt, “fromage frais” (under 15g total carbohydrate / pot) 2-3 squares 70% coco solids chocolate

Condensed, evaporated milk

Crème Fraiche, Cream

Ready meals/stir in sauces/take away:
Some ready meals and sauces contain significant amounts of sugar, for example sweet and sour sauces, jar or packet Chinese sauces. Chinese takeaway. Tomato soup, Baked Beans, tinned spaghetti

Tomato-based pasta sauces. Tomato-based/dry curries. Reduced sugar baked beans (drain off sauce)

Bed-time and Malted drinks such as Ovaltine, Horlicks, drinking chocolate.

Cadbury’s Highlight, Ovaltine Options, cocoa powder.

The following foods have little impact on blood glucose levels and can be eaten in your usual amounts.

Filling up on more non starchy vegetables / salad and protein foods such as chicken, fish, meat, eggs, cheese, tofu, Quorn® may help with hunger.

Nuts and seeds

Tea, coffee, sugar free squash and sugar free fizzy drinks

Marmite, Vegemite, Bovril, Oxo

Salt, pepper, herbs, spices, vinegar and mustard

Oil, butter and margarine

You do not need to eat any special "diabetic foods" as part of your diet.

Snacks

The following snacks contain enough carbohydrate to have mid-meals:

- 1-2 pieces fruit.
- 2 whole-wheat crispbreads or oatcakes with low fat cream cheese.
- Small pot yoghurt.
- Packet crisps.
- 1 slice wholemeal bread sandwich or toast.

The following snacks are carbohydrate free and can be eaten any time:

- Natural nuts or mixed seeds
- Olives
- Vegetable pieces with humus, cream cheese or salsa dips.
- Avocado
- Cherry tomatoes
- Cubes of cheese (try with cocktail onion or gherkin), mini mozzarella
- Sun blushed or sun dried tomatoes
- Cooked meats
- Sugar free jelly
- Corn on the cob
- Boiled egg
- Celery with cream cheese down middle
Physical activity

Regular physical activity will improve your body’s sensitivity to insulin and make it more effective; especially if this is done **just after meals**.

**You are recommended to walk or be active (see below) for 10-15 minutes after meals and large snacks.**

This is just as important as the dietary changes and can make up to 2 mmol difference to your post meal glucose reading.

**Helpful types of activity include**: walking, swimming or cycling, being active around the house, moving legs whilst sitting on a chair.

If you are struggling with increasing activity discuss this with us in clinic.

**Weight gain**

Being overweight or gaining too much weight in pregnancy can add to the same risks as having GDM.

Keeping your weight stable for the rest of your pregnancy can help reduce these risks and make the blood glucoses easier to manage with diet and activity.

Many women find that following the diet and lifestyle recommendations for GDM prevents any further weight gain.

Eating more protein foods and healthy snacks can help manage hunger

If you are concerned about your weight please discuss this with us in clinic.

**Sleep**

Please let us know if you are struggling to sleep at night as this can affect your blood glucose level first thing in the morning.

**Blood glucose monitoring**

You will be asked to monitor your blood glucose levels **four times every day**:

- Before breakfast
- One hour after breakfast, lunch and dinner (**timed from start of meal**)

It is important you always wash your hands before testing to avoid getting false high results. Keep to soap and water and avoid alcohol gels and wipes as these can affect the result.

The blood glucose levels you are aiming for are listed below:

<table>
<thead>
<tr>
<th>Time</th>
<th>Blood glucose level mmol/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting</td>
<td>less than 5.3</td>
</tr>
<tr>
<td>One hour after meals (timed from start of meal)</td>
<td>less than 7.8</td>
</tr>
<tr>
<td>One hour after meals If body mass index greater than 30 at booking</td>
<td>less than 7.0</td>
</tr>
</tbody>
</table>
If you get a reading above target range write down what and how much you ate at the meal before or if you were inactive or feeling unwell.

If you get three readings above these targets contact us on the numbers at the front of your diary.

**Will I need to have medication?**

Not necessarily; many women are able to regulate their blood glucose levels by being careful with their diet and being physically active.

However, some women do not produce enough insulin to manage what they need to eat to support a healthy pregnancy and in spite of their best efforts need to start some medication to keep blood glucose levels in the normal range.

There are two options for medication:

**Metformin** is a tablet that enables the insulin you produce to work more effectively.

Or

**Insulin injections** to “top up” the limited amount of insulin you are able to produce. This may be before bed and / or before meals.

Which is the best choice for you will be discussed with you in clinic. There is also a leaflet giving more information on medication choices available on request.

**Obstetric care**

You will be offered a scan to monitor the growth of your baby at 28, 32 and 36 weeks (or the next available opportunity if already over 28 weeks). You will also have an appointment with the obstetric team to discuss the result of the scan. If your care was previously community-based you will now be allocated a consultant obstetrician lead to help plan your care for the remainder of your pregnancy.

It is important to continue to see your community midwife throughout your pregnancy for routine ante natal care.

**Birth**

Your baby will be born on the delivery unit where you and your baby will be closely monitored and additional medical support is available if required.

The delivery date and plan are likely to be affected by having GDM. You will have the opportunity to discuss this with the obstetric team and the specialist midwife between 32 and 36 weeks.

When and how you deliver is influenced by a number of things; your choice, how your gestational diabetes has been managed and the growth of your baby. NICE guidance recommends that all women with diet controlled GDM should deliver by 40+6 weeks. If you have required insulin or metformin to manage your glucose levels it is recommended that your baby should be born earlier, around 38 or 39 weeks.
The reason for this is because the health of the placenta can be affected by diabetes and as the pregnancy reaches term the placenta can struggle to keep up with the needs of your baby.

If you don’t go into spontaneous labour before your recommended delivery time you will need to be induced. As not all inductions work in a timely way you may need a caesarian section.

This will be discussed with you towards the end of your pregnancy.

**Diet during birth** - If you are eating during labour it is important that you keep to the diet you have been following to keep your blood glucose below 7 mmols. You may wish to bring some of your own snack foods and drinks in with you that you know don’t cause high blood glucose levels.

You and your baby will need to remain in hospital for monitoring for 24 hours

**Blood glucose monitoring**: Continue to test your blood glucose levels during labour and for first 24 hours after delivery.

Once delivered your target blood glucoses change:

- **Fasting** - less than 7 mmols
- **One hour post meals** - less than 11.1 mmols

If you get readings above these levels please inform a midwife.

**Infant feeding**: Breast feeding is encouraged as a good option for both you and your baby. If you plan to breast-feed and would like information on colostrum harvesting please mention this at your 36 week appointment.

**Changes from today**:

- Test blood glucose levels 4 times daily: on waking and 1 hour after meals
- Be active for 10-15 minutes after main meals

**Suggested menu changes**:

**Split breakfast**:
7-8am have small pot yogurt with cup berries sprinkled with seeds
9-10am have 1 x medium slice of wholemeal toast with protein topping (cheese/ ham/ egg/ peanut butter)

**Mid-day meal**:
2 x medium slices wholemeal bread sandwich with protein filling
Or Soup and wholemeal roll.
Or as for evening meal
1.5 - 2 hours later have fruit or yogurt

**Evening meal**:
4 x egg sized potatoes or 4 x tablespoon cooked rice, pasta or grains
Generous portion of protein and plenty of vegetables or salad.
1.5 - 2 hours later have fruit or yogurt
**Snacks:**
Two carbohydrate containing snacks are suggested across the day to have between meals. Carbohydrate free snacks can be eaten at any time.

**Contact telephone numbers:**

**Monday to Friday**

Diabetes specialist nurse: 01223 348780 / 01223 348122

Dietitian: 01223 348905 / 01223 349471

Midwife: 01223 217657 (answerphone)

Appointments: 01223 217664

**Anytime:**

Maternal assessment unit 01223 217217

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We are a smoke-free site: smoking will not be allowed anywhere on the hospital site. For advice and support in quitting, contact your GP or the free NHS stop smoking helpline on 0800 169 0 169.

**Other formats:**

If you would like this information in another language, large print or audio, please ask the department where you are being treated, to contact the patient information team:
patient.information@addenbrookes.nhs.uk.

Please note: We do not currently hold many leaflets in other languages; written translation requests are funded and agreed by the department who has authored the leaflet.

**Document history**

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Contact number: 01223 245151

Publish/Review date: April 2018/April 2021

File name: Gestational_diabetes

Version number/Ref: 4/PIN2663/17698