

Type 1 and Type 2 diabetes and pregnancy care

If you are pregnant and have Type 1 or Type 2 diabetes this leaflet aims to outline the care offered at the Royal Berkshire Hospital. If you need any further information, please contact the diabetes specialist midwives on 0118 322 7245 or your GP.

Pregnancy and diabetes

Getting pregnant with high blood glucose increases the risk of miscarriage and abnormalities in the baby. Good glucose control prior to and during the pregnancy minimises these risks. The quality of the glucose control is measured by the HbA1c test, and this should be, at the time of conception, as close to 43 mmol/mol (6.1%) as can safely be achieved, certainly, less than 53 mmol/mol (7%). If HbA1c is above 86mmol, it is safer not get pregnant. If you are planning a pregnancy and are struggling to achieve good control, we advise you ring the diabetes specialist midwives for help and advice. If you are planning a pregnancy, see your GP and ask for folic acid tablets, 5mg, which is only available on prescription.

When you become pregnant we would like to see you as early as possible in the diabetes antenatal clinic. This is so that we can support you in achieving the optimum control of your blood glucose for your pregnancy. So that a formal referral can be sent to us, you will need to visit your GP but to save time you may, also, telephone the diabetes specialist midwives on **0118 322 7245** and they will arrange an early appointment in the antenatal clinic.

Who will I see during my pregnancy?

When you are pregnant and have diabetes you need close monitoring during pregnancy, the birth of your baby, and postnatally. This is because your pregnancy may affect your diabetes and the diabetes may affect your pregnancy.

Research evidence shows that the kind of care you need is best given by a team of professionals specialising in diabetes and pregnancy. At the Royal Berkshire NHS Foundation Trust this team includes:

- A consultant obstetrician (doctor specialising in pregnancy and birth), who has a special interest in diabetes.
- Consultant diabetes doctors.
- Diabetes specialist midwives.

Other professionals are also part of the team, which includes the ultra-sonographer, diabetes nurses, members of the eye and renal (kidney) departments, dietitians and the anaesthetists. This combined approach allows good communication between the team, who can work in partnership with you.

Antenatal care – general information

Your care will be given in the Joint Diabetes Clinic, which is held in the antenatal clinic, on level 2 of the Maternity Unit at the Royal Berkshire Hospital. Clinics are held on Thursday afternoons.

There may be a mix of virtual and face to face appointments.

A booking appointment with your community midwife should be made, if not already arranged. She will take a medical/obstetric history and give you your own set of hand-held notes, which you should always remember to bring with you. At this appointment, your community midwife will explain how to book first trimester screening if you would like to have this test.

Antenatal classes

At your booking appointment you will be given information by your community midwife about antenatal education. The Birth and Beyond Antenatal programme will usually be offered. To book on to your course, visit www.nct.org.uk/BerkshireAntenatal

MatB1 certificate

Your employer will request a MatB1 certificate, which you can get from your community midwife or GP after 20 weeks. We do not get supplied with these at the hospital but please let the diabetes specialist midwife know if you are having difficulty getting one.

Clinic visits

The first person you see in the antenatal clinic will be our health care assistant, who will take your blood pressure, test your urine and record your weight and height. You will then see the consultant obstetrician, together with the consultant diabetes doctor and the diabetes specialist midwife. They will review your diabetes care, make medication adjustments according to your needs and review the growth and well-being of your baby.

You will be asked to monitor your blood glucose at home six times per day:

- A fasting blood glucose, taken when you first get up in the morning and 1 hour after eating breakfast
- Just before eating lunch and 1 hour after eating.
- Just before eating your evening meal and 1 hour after eating.

We will ask you to download an app called GDM Health this is a free app which allows blood glucose readings to be sent directly to us, if unable to load or use the app you will be asked to email readings weekly. Even if you are using another form of glucose monitoring, such as continuous glucose monitoring or flash monitoring, we suggest you download the app because we often use it to communicate by text. On your first visit to clinic, if you do not have a meter you will be given one with a logbook so you can start monitoring your blood sugars. It is really important to bring the logbook to all clinic visits you are unable to use the app.

The recommended glucose target range in pregnancy is very tight

- Fasting: less than 5.3 mmol/l
- Before lunch & evening meal: 4-6 mmol/l
- One hour after eating: Less than 7.8 mmol/l

NICE Guidance (2020) recommends that if you have Type 1 diabetes you are offered continuous glucose monitoring, or if this is not suitable for you flash glucose monitoring where you scan to upload results from the sensor. CGM will be considered if you are using insulin but are not type 1 diabetic, have severe hypos or poor hypo awareness or if your glucose levels are very unstable.

Your insulin requirements will increase throughout the pregnancy, so your home monitoring results are important as a guide to make safe adjustments to your insulin doses.

After your clinic visit, the next appointment will be arranged which you should book at reception before leaving. Appointments can vary between weekly to every 4 weeks.

The consultations, up to 24-26 weeks, focus strongly on the diabetes control, as this is the most important aspect of the pregnancy at this stage. After 27-28 weeks you will be offered regular scans, which take the place of feeling the tummy and listening to the baby.

During your pregnancy we will try to achieve the target glucose levels, this may increase the risk of severe hypoglycaemia. For those on insulin, you can be supplied with GlucoGel concentrated glucose solution if you need it and, if you have type 1 diabetes, you can be prescribed a Glucagon injection that your partner, relative or work colleague may give in the event that you become unconscious. This injection will raise your blood sugar and you will return to consciousness. We can give instructions on its use if needed.

Due to the risk of severe hypoglycaemia, we advise that you do not take a bath while there is no other adult person present in the house.

Why is it important and what are the risks?

When your blood sugar remains high, then your baby will be affected by those high levels and their growth and development can be adversely affected. Good control of blood sugars during pregnancy can reduce the risk of the following:

- Increased risk of miscarriage, birth defects and still births.
- Large baby (Macrosomia).
- Difficulty delivering babies shoulders leading to trauma to both mother and baby (called shoulder dystocia).
- Induction of labour and its possible failure which would lead to Caesarean section.
- Low blood sugar in your new-born baby (called neonatal hypoglycaemia).
- Loss of your baby in the days and weeks around delivery (known as perinatal death).
- Childhood obesity in later life.
- Increased risk of operative delivery.
- Your baby being admitted to the Special Care Baby Unit.

Antenatal insulin therapy

Some types of insulin and insulin schedules are not ideal for pregnancy, and it is possible, in some cases, that changes will be recommended.

Oral hypoglycaemic medication

For type 2 diabetics taking tablets, a change to or addition of insulin may be necessary.

Metformin is used in pregnancy, but all other diabetes tablets may be stopped. You will be advised if insulin is needed and instructed in its use. You will be given equipment to get you started but repeat supplies will need to come from your GP.

Other medications

Other medication that you may be taking will be reviewed. Some drugs cannot be taken in pregnancy and, again, changes may be needed. This particularly applies to certain kinds of blood pressure and cholesterol lowering tablets.

Folic acid

Folic acid tablets will be recommended up to the 12th week of your pregnancy. Folic acid helps in the prevention of spinal defects in babies and is commonly taken during pregnancy. You will be advised to take 5mg daily, which is a higher dose than that usually taken and is only available on prescription. Repeat supplies should be obtained from your GP.

Low dose aspirin

Taken to reduce the risk of developing pre-eclampsia, having a baby smaller than expected and giving birth prematurely, that is delivered before 37 weeks. 150 mg once a day in the evening. This is taken from 12-36 weeks unless otherwise advised.

Vitamin D

Everyone who is pregnant is advised to take a Vitamin D supplement in pregnancy and while breastfeeding as Vitamin D is required for healthy skeletal growth and bone health. A newborn's vitamin D status is largely determined by the level of vitamin D taken during pregnancy.

Eyes

Eye changes related to diabetes are possible due to the pregnancy and you will be referred for additional eye screening in pregnancy. Screening checks will be arranged, one at the beginning and one in the middle of the pregnancy. If changes to the eyes are detected more frequent monitoring and possibly treatment may be advised.

Urine testing

Every visit will include testing a sample of your urine. If there are any concerns this may be sent for further tests. Finding protein in the urine may indicate to us that your kidneys are being affected by the pregnancy or it may be a sign of pre-eclampsia. If you have a significant amount of protein in the urine we may refer you to the renal (kidney) specialists.

Blood pressure

Your blood pressure will be checked at every antenatal visit. This is an important test as a rise in blood pressure can alert us to the onset of pre-eclampsia, or to pregnancy-related stress on the kidneys due to the diabetes.

Pre-eclampsia pressure

Pre-eclampsia is a condition of pregnancy that is usually characterised by high blood pressure, protein in the urine and swelling. If you have diabetes you are more prone to pre-eclampsia. If pre-eclampsia is severe, you may be advised to be admitted to hospital and, occasionally, early delivery is needed.

Body mass index (BMI)

We will want to know your weight and height so we can work out your body mass index (BMI). If your BMI is 40 or greater, we will recommend an appointment with an anaesthetist. This helps us to assess the safety of giving you an anaesthetic and we like to make this assessment whether we anticipate the need for an anaesthetic or not. This appointment will be on a weekday morning.

Laboratory blood tests

It is routine in all pregnancies for blood samples to be recommended to check your health during the pregnancy. In addition, specialist samples will be needed to monitor the effect of your diabetes:

- An HbA1c measures your blood glucose control over approximately the last 3 months. NICE guidelines recommend that HbA1c levels should be below 48 mmol/mol (6.5%) during the first 12 weeks of pregnancy (also called the first trimester). HbA1c levels below 48 mmol/mol (6.5%) help reduce the risk of miscarriage, birth defects in babies, and stillbirth or death in newborns. Your HbA1c will be checked each trimester.
- At the beginning of pregnancy, screening of your thyroid function is recommended, as problems with the thyroid can occur more commonly with diabetes. If you already have thyroid problems, regular blood checks of your thyroid function will be ordered, and your medication may need to be altered.
- At the beginning of the pregnancy and towards the end we recommend a blood sample to check your kidney function.
- If your blood pressure rises, we recommend bloods to screen for pre-eclampsia, including samples to monitor your kidney and liver function and some of the factors involved in blood clotting.

Ultrasound

- An ultrasound will be offered at, or as soon as possible after, 7 weeks. To accurately date the pregnancy a further scan will be arranged between 11 weeks and 3 days, and 13 weeks and 6 days.
- A routine scan at 20 weeks will be offered to check the baby's general anatomy.
- After 28 weeks ultrasound scanning will be done more frequently, usually every 4 weeks, to monitor the growth of the baby. If the baby's growth is normal scanning may only be recommended monthly.

Contact between appointments

It is common for the diabetes specialist midwives to contact you between visits to adjust insulin doses or to ascertain that you are comfortable with your medication. Their contact details are at the end of this booklet. For urgent problems you should ring the Triage line on **0118 322 7304**.

Steroids

If there is any risk of delivery before 36 weeks, steroids will be considered. Steroids help reduce the risk of respiratory problems, necrotising colitis and intra-cranial haemorrhage in babies born

early. Steroids have however been shown to cause low blood glucose in the newborn and in late preterm birth (from 36 weeks) there is some evidence that steroids increase neurodevelopmental problems in later life with no benefit in reducing RDS, Steroids can cause a significant rise in the blood glucose levels and, occasionally admission to hospital for 2 to 3 days for observation is needed. You may need intravenous insulin until the effect of the steroids has passed, when you will be able to return to your subcutaneous insulin and go home.

Anaesthetic appointment

If any anaesthetic risk is identified during the pregnancy you may be asked to see one of our consultant anaesthetists. Following this appointment, a report will be put into your notes for the anaesthetist on duty to refer to on your admission to the Delivery Suite.

Hospital admission

Self-administration of insulin while in hospital

When admitted to the maternity unit and while you are taking subcutaneous insulin, it is recognised that allowing you to self-manage your insulin injections and doses results in better diabetes control. This must be carried out safely and there are procedures to be followed. Initially a questionnaire needs to be filled in by the staff to ensure that you are safe to manage your own injections, e.g., you have not had a general anaesthetic in the previous 24 hours. You will be asked to read an information leaflet, agree to keep your insulin safely, out of sight and to record your blood glucose readings and insulin doses on a special form, which you will be asked to sign. This will all be explained to you on admission.

Delivery

The advice regarding the timing of birth and how you will give birth to your baby depends on how well the diabetes is controlled during your pregnancy and the growth of baby.. Diabetes complications prior to pregnancy and any previous Caesarean sections will affect the advice given. If there are no medical or pregnancy related complications you will be offered delivery at 37+0 -38+6 weeks when delivery is recommended for all those with diabetes due to the increased risk of stillbirth (CEMACH 2006 Pregnancy in women with type 1 and type 2 diabetes 2002-2003).

Induction of labour

If the baby is estimated to be of normal weight and there are no other factors indicating a need for Caesarean section, then induction of labour will be recommended.

Monitoring

Babies of mothers with diabetes do not always cope well with the contractions of labour. Therefore, it is necessary to monitor your baby constantly with a heart monitor while the labour is in progress. This is usually done with a monitor on your tummy but, in some instances, if the external signal is inadequate, it is advisable to put a small clip on the baby's head to monitor the baby's heart.

Intravenous insulin at the time of birth

Once in labour, diabetes needs careful monitoring.

In case you need an emergency Caesarean section you will be recommended not to eat during labour. Consequently, your usual subcutaneous insulin schedule is not appropriate. The best method of ensuring adequate control of your blood glucose is with the use of an insulin intravenous infusion, also known as an insulin sliding scale. (VRII)

We use an intravenous infusion of 10% glucose, with potassium added to meet your requirements, and this is given through a pump to give you 100mls per hour. This amount takes into account your energy needs in labour. With this, through the same tube, and through another pump, a small dose of insulin is given. You will be asked to check your blood glucose every hour and the insulin will be adjusted accordingly. Intravenous insulin does not last very long in the body so the amount given can be adjusted easily and your response will be immediate.

If you are induced, you will need two separate intravenous lines. If possible these may be put into the same arm so that you have one arm completely free.

Vaginal birth

If the baby has coped well with the labour and you make normal progress you will give birth with only your midwife and your partner in attendance. If the midwife feels it is appropriate, she may ask for a paediatrician (baby doctor) to attend. If you need help to give birth to your baby, the duty doctor for the Delivery Suite will attend the birth and, in some situations, this doctor may advise that the delivery be carried out in the operating theatre rather than in your delivery room. The duty anaesthetist will be available to provide epidural pain relief, if you wish, or to provide epidural or spinal pain relief for an assisted or Caesarean birth.

After delivery, as soon as you feel like eating and drinking, you may return to your subcutaneous insulin and the intravenous insulin can be stopped.

Emergency Caesarean section with diabetes

If, during the course of your labour, an emergency Caesarean section is advised, your diabetes will continue to be controlled with the insulin sliding scale used in labour. After the birth you will be transferred back to your room from the operating theatre. If feeling nauseous or sick you may have anti-sickness medication.

For the sake of your safety, the midwife will continue the VRII until she is sure the effects of the anaesthetic, strong analgesia or extreme tiredness have passed, and she is sure you can safely self-manage your diabetes.

When you are entirely capable of managing your own diabetes care you will be encouraged to do so. When it is felt appropriate, you will be offered food. If this is tolerated, it should be followed immediately by a dose of subcutaneous insulin. For safety, the midwife may want to check the first postnatal dose of subcutaneous insulin that you give yourself.

Planned Caesarean section with diabetes

You may be advised in the antenatal period to have a planned Caesarean section.

You will not be able to eat after midnight. Therefore, the night before your operation, you will be advised to take a smaller dose of insulin than usual. This will be discussed with you shortly before the planned date of operation.

To ensure minimal disruption to your diabetes, you will be first on the operating list. You will be advised not to have your morning dose of insulin, but insulin may be given with glucose through the intravenous infusion during the Caesarean. When able to eat, a small amount of toast will be offered with a drink of your choice, and you may take a dose of subcutaneous insulin.

Postnatal care

Immediate postnatal insulin and diabetes management

After delivery, the insulin doses required quickly fall to the pre-pregnancy levels and it is recommended, for the prevention of hypoglycaemia, that the pre-pregnancy doses are reduced by about a third to a half.

At the beginning of pregnancy, your pre-pregnancy insulin doses will have been recorded in the hospital notes. We will refer to these and recommend suitable postnatal insulin doses when we see you for your pre-delivery discussion at 34-36 weeks of pregnancy in the Joint Diabetes Clinic. A post-delivery plan will have been recorded in your notes. The plan will have been discussed with you as will the method of follow-up.

Following the birth of your baby, when ready to eat, and, if a meal is tolerated, you will give an appropriate subcutaneous insulin dose, following which, the intravenous insulin can be stopped. If you were managed by diet, prior to starting insulin in pregnancy, after delivery you will probably return to diet control, with close monitoring of your blood glucose to assess the need for reintroduction of treatment.

The newborn baby

The diabetes can affect the baby in various ways and the quality of diabetes control during the pregnancy is important to minimise any adverse effects on your baby. The severity of any long-term diabetic complications that you had prior to pregnancy will also affect the way the baby responds after birth. Your baby will not be born with diabetes and most babies born to mothers with diabetes have little or no problem.

Infant feeding

- **Breastfeeding:** Breastfeeding has many benefits and, in particular, is protective against type 1 and 2 diabetes, obesity and heart disease later in life, as well as being protective against common infections after birth. Antenatal breastfeeding classes are available and can be booked by calling 0118 322 8964. We will strongly encourage you to attend. Towards the end of your pregnancy, antenatal expressing of breast milk will be discussed. This colostrum can be frozen and brought in for the baby after birth and may help to restore a low blood sugar in the baby.
- **Formula feeding:** If you wish to feed your baby with formula, or, if you are unable to breastfeed, you will need to bring a starter pack in of infant formula. You will be asked to feed your baby regularly rather than demand feed your baby and you will be shown how to make up feeds so that you are able to do this correctly when you get home.

Hypoglycaemia (low blood sugar)

While inside your body, even with very well controlled diabetes, the glucose environment for the baby is often higher than in a pregnancy unaffected by diabetes and, to maintain a normal blood

glucose, the baby may need to produce more insulin than average.

After birth, the baby's high insulin production can take a few days to settle down. This means that, without the constant glucose supply from you, the baby's blood glucose can quickly drop to hypoglycaemic levels (excessively low blood glucose). In a newborn baby, we like the blood glucose to be above 2.5mmol/L. This is quite a bit lower than you would consider normal for yourself. We take great care over the baby's blood glucose level because it is thought that untreated hypoglycaemia can cause harm to the baby's brain development. A low blood glucose for a short time is not thought to harm the baby.

Immediately after birth, the baby's blood glucose will reflect your own blood glucose level, and then a natural drop in blood glucose occurs in most newborns. Therefore, we test the baby's blood glucose, at about four hours after birth, or before the second feed, whichever is sooner. By this time, we will see the effect of the baby's own insulin production on his or her blood glucose. If the baby is showing signs of hypoglycaemia before four hours then the blood glucose will be checked sooner.

If you wish to breastfeed, you will be encouraged to put your baby to the breast as soon as possible after birth and to feed your baby very frequently. If the baby's blood glucose becomes very low we may need to recommend a supplement of milk. If you had been able to express any colostrum prior to delivery and bring it with you this could also be given to the baby to help treat a low blood glucose.

Hypothermia (low temperature)

A newborn baby can become cold very quickly and will use a lot of energy and, therefore, blood glucose to bring the temperature back to normal. For this reason, we pay particular attention to keeping the baby warm. At birth, a hat will be placed on your baby's head and immediately after birth we will want to dry the baby thoroughly. Skin-to-skin contact with your baby is fine, but the baby should remain covered under warm towels and blankets. The baby should be exposed to the air as little as possible during activities such as weighing and dressing.

Breathing difficulties

The lungs of babies from diabetic mothers can develop later than babies from mothers without diabetes. For this reason, we will observe your baby's breathing after birth for any signs that the baby is working extra hard to breathe. When this happens, one of the first signs we recognise is noisy breathing. This is known as 'grunting.' If we hear grunting, or if there are other signs of laboured breathing, we will ask the paediatrician to see the baby. Grunting may mean that the baby will need to go to the Special Care Baby Unit to receive more intensive therapy and monitoring than can be given on the ward. The duration of breathing difficulty can range from a few hours to a few days, usually depending on the gestation at delivery.

Special Care Baby Unit

Babies who are born at term and are within a normal weight range at the time of birth are less likely to need to go to the Special Care Baby Unit. Babies who have become very large have a greater risk of needing special care. The Special Care Baby Unit, also known as the Neonatal Unit, is called Buscot Ward and is on level 6 of the Maternity Block. After giving birth, as soon as you are up and around, you will be encouraged to visit your baby as much as possible. In the

immediate period after delivery, your partner can visit if you are unable to go. They will be given a photograph of the baby for you to have.

Postnatal ward

If there are no problems after the birth, you will be transferred with your baby to the postnatal ward. Here the staff are trained in the care of babies who need extra monitoring. Your baby will continue to need regular blood glucose checks until the blood sugars are stable. This normally takes at least 24 to 48 hours.

Jaundice

Before birth, the baby is likely to have a higher than average number of red blood cells, which are not needed after delivery. Breaking down the excess red cells can sometimes lead to jaundice 2 to 3 days after birth. This can be more common in babies of mothers with diabetes. If your baby becomes jaundiced, small blood samples will be taken from your baby's heel to check the jaundice level. If it is found to be too high, artificial sunlight therapy will be started. If the baby is otherwise well, this can be done on the ward, by your own bed.

On-going insulin requirements

During the first few days following delivery, your blood glucose levels may be a little erratic. It will not matter if your blood glucose is a little high after delivery, providing we reintroduce insulin appropriately. The diabetes midwives will make regular visits to the postnatal ward to advise you about this.

If you deliver over a weekend, or a bank holiday, when the diabetes midwives are not available, if you feel confident to self-adjust your insulin, then increase your doses by 1 or 2 units per dose until your levels are between 5 – 8 mmol/L. This is slightly higher than that recommended during pregnancy. Midwives on the ward can ask the medical staff for advice or contact the on-call endocrine doctors.

Some find that while breastfeeding they notice a fall in their blood glucose, and we recommend that you have some rapid acting carbohydrate food or drink near you while feeding your baby. When at home, you may contact us to help you with insulin adjustment. We are allowed to give advice to you up to 6 weeks after birth, after which we can no longer manage your diabetes care.

Length of stay

The length of time you stay in hospital will depend on how you have given birth and, more significantly, the baby's progress after birth. It may be as little as 24 hours or as much as several days.

Postnatal follow-up

A plan for postnatal follow-up will have been discussed with you in the Joint Diabetes Clinic. If circumstances change this can be adapted. If you normally have your diabetes care at the Diabetes Centre, Melrose House, you are usually given a postnatal appointment, after delivery to review the diabetes control. This does not replace the usual 6-week postnatal appointment with your GP.

If your GP normally oversees your insulin and diabetes care you are not usually given a postnatal appointment at the hospital.

If your diabetes has been managed with Metformin or diet control alone, your postnatal appointment can be 6 weeks after delivery with your GP only.

Remember

The diabetes maternity team, in co-operation with you, can give you the help and support you need to avoid, minimise or manage complications in your pregnancy and while the commitment is great on your part, we anticipate a successful outcome for you.

You may find the following websites useful. They include valuable information about all aspects of pregnancy, childbirth and the postnatal period.

- www.nhs.uk/conditions/pregnancy-and-baby/pages/pregnancy-and-baby-care.aspx#close
- <https://www.nhs.uk/pregnancy/related-conditions/existing-health-conditions/diabetes/>
- <https://www.diabetes.org.uk/guide-to-diabetes/life-with-diabetes/pregnancy/during-pregnancy>
- <https://www.tommys.org/pregnancy-information/pregnancy-complications/type-1-or-type-2-diabetes>

Future pregnancies and family planning

You can become pregnant while breastfeeding and before you start having periods again. It is very important that you return to an effective method of contraception prior to resuming sexual intercourse. If you think that you may resume sexual intercourse before your 6-week GP postnatal appointment, then see your GP or family planning clinic sooner.

Contacting us

Diabetes Specialist Midwife Tel: 0118 322 7245.

To find out more about our Trust visit www.royalberkshire.nhs.uk

Please ask if you need this information in another language or format.

Diabetes Specialist Midwives, December 2008

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Our Maternity Strategy and Vision

'Working together with women, birthing people and families to offer compassionate, supportive care and informed choice; striving for equity and excellence in our maternity service.'

You can read our maternity strategy here

