DOCUMENT CONTROL PAGE

Title:	Diabetes: Antenatal Screening and the Management of Gestational Diabetes Mellitus (GDM)
Version:	1.2
Supersedes:	Version 1.1
Application:	All Staff at Manchester University NHS Foundation Trust

Originated /Modified By:	Dr B Issa, Dr K Cheer, Dr A Anbazhagan, Dr A Pilkington, Dr J Myers, Dr M Whitworth, Dr K MacLeod, Dr T Kelly, Dr S Rahman, Dr S Hamilton, Dr S Stevens, Dr C Mumby, Dr P Rao-Balakrishna, Dr A Dempsey, G Kearney, S Quinn, C Jennings, H Burns, A Sims, Jodie Aspinall, J Hince.
Designation:	Diabetes Multidisciplinary Team
Ratified by:	Site Obstetric Quality and Safety Committee
Date of Ratification:	10/11/21
Ratified by:	Medicines Management Committee
Date of Ratification	11/06/21
Ratified by:	North Manchester Clinical Guideline Committee
Date of Ratification:	13/01/22

Issue / Circulation Date:	03/12/21. V1.2 circulate 21/11/2022
Circulated by:	Clinical Governance Team Maternity
Dissemination and Implementation:	Clinical Governance Team Maternity
Date placed on the Intranet:	21/11/2022

Planned Review Date:	01/01/25
Responsibility of:	Clinical Governance Team Maternity

Minor Amendment (If applicable) Notified To:	Site Obstetric Quality and Safety Committee: Harmonised for use across MFT (13/01/22). Additional information for BMI > 50 and previous bariatric surgery requiring GTT (10/08/2022). Section 2.4 added to ensure staff are aware of process in the event of Polycal being unavailable (09/11/2022).
Date notified:	As above.

EqIA Registration Number:	2021-305R

1 Introduction

Gestational Diabetes Mellitus (GDM) is defined as carbohydrate intolerance resulting in hyperglycaemia (raised blood glucose levels) with onset or first recognition during pregnancy.

GDM is associated with an increased risk of having a baby who is macrosomic which increases the likelihood of birth trauma, shoulder dystocia, induction of labour and Caesarean section. The baby is at risk of neonatal hypoglycaemia, transient neonatal morbidity requiring admission to the neonatal unit and perinatal death. GDM increases the risk of developing future type 2 diabetes and the baby developing obesity and/or diabetes later in life (NICE, 2015).

Early diagnosis, prompt intervention and good diabetes control can improve perinatal outcomes.

Some individuals with GDM will respond to changes in diet and exercise. However, most will require oral hypoglycaemic agents (metformin), insulin or both to control blood glucose levels.

Maintaining blood glucose levels in the normal range (4-8 mmol/L) during labour can reduce the risk of neonatal hypoglycaemia and need for admission to special care baby unit.

2 Detail of the guideline

Pregnancies with pre-existing diabetes or impaired glucose tolerance outside of pregnancy should be managed as per *Management of antenatal, intrapartum and postnatal care for women with pre-existing diabetes* guideline.

2.1 Antenatal Screening

2.1.1 Risk assessment for GDM: Criteria for oral glucose tolerance testing (OGTT) in pregnancy

A universal risk assessment must be undertaken in early pregnancy and a decision made whether an OGTT is recommended (NICE, 2015).

In the presence of any one of the risk factors listed below in Table 1, women and birthing people are at a higher chance of GDM and must be offered an HbA1c at booking and an OGTT at 24 to 28 weeks (ideally 26 weeks).

See table 1 below.

Table 1- Risk Assessment for GDM

Any **ONE** of the following:

- BMI 30 kg/m^2 or higher (BMI ≥50 kg/m^2 recommend 16/40 and 26/40 GTT)
- Previous large baby (>4.5kg or >97thcentile on growth chart)
- Previous gestational diabetes (see *section 2.1.2*)
- Parent, brother or sister with diabetes
- Family origin with a high prevalence of diabetes which includes South Asian (specifically from India, Pakistan and Bangladesh), Chinese, Black African, Black Caribbean and Middle Eastern (specifically from Saudi Arabia, United Emirates, Jordon, Oman, Kuwait, Lebanon and Egypt).
- Antipsychotic medication (Olanzapine, Risperidone, Quetiapine, Clozapine, Aripiprazole, Haloperidol & Lithium) – follow the same pathway as previous GDM (i.e. OGTT and HbA1c as soon after booking as possible)
- Previous bariatric surgery

Medical disease requiring immunosuppressant medication (including oral steroids), should prompt assessment for GDM screening via their specialist antenatal care team.

In the case of pregnancies with previous bariatric surgery, see *Care for women in pregnancy with history of bariatric surgery* guideline as home blood glucose monitoring (HBGM) might be recommended in place of OGTT.

An OGTT should not be performed after 34^{+0} weeks gestation without prior discussion with a consultant obstetrician who is a member of the specialist diabetes team. If a woman or birthing person presents for an OGTT >34^{+0} weeks and is already fasted, a fasting sample should be obtained and the reasons why a full OGTT is not appropriate should be explained (no evidence base for determining an abnormal result).

2.1.2 HbA1C at booking

HbA1c <48mmol/mol and no previous diagnosis of GDM – continue ongoing risk assessment and repeat screening as per section 2.3.

HbA1c ≥41mmol/mol and previous diagnosis of GDM – urgent referral to diabetes team.

HbA1c ≥48mmol/mol – urgent referral to diabetes team.

2.1.3 Ongoing Risk Assessment

Ultrasound findings

Polyhydramnios and/or an estimated fetal weight (EFW) >97th centile and/or abdominal circumference (AC) >97th centile on the growth chart should trigger an OGTT and HbA1c (unless this is after 34^{+0} weeks gestation). After 34 weeks gestation, advise that there may be an association with GDM, but the sensitivity of screening for GDM is low after 34 weeks. After 34 weeks, home blood glucose monitoring (HBGM) can be considered and discontinued following 7 days of normal readings.

See *Large for Gestational Age and Polyhydramnios – investigation and management guidelines.*

Glycosuria

Glycosuria ≥2+ on one occasion, or 1+ on two separate attendances, should trigger an OGTT (unless this is after 34^{+0} weeks gestation). These attendances do not need to be consecutive.

When glycosuria is present ≥2+ on one occasion, or 1+ on two separate attendances *after* 34^{+0} weeks gestation with no risk factors for GDM, referral should be made for a growth ultrasound scan and manage findings appropriately.

Treatment for GDM >34 weeks will not modify fetal growth. Diagnosis and treatment of GDM in late gestation should only be considered where its exclusion will significantly alter ongoing obstetric management. High risk cases after 34 weeks gestation can be discussed with a CONSULTANT from the diabetes team to determine whether HBGM is appropriate.

It should be noted that where the fetal biometry indicates asymmetrical LGA it may be appropriate to manage the pregnancy in line with the GDM policy (i.e. consider early induction).

2.2 GDM in a previous pregnancy

2.2.1 A previous pregnancy with GDM should be identified at booking and the risk of developing GDM discussed. An HbA1c blood test should be performed with the booking blood tests (up until 20^{+0} weeks gestation). An HbA1c ≥41mmol suggests impaired glucose tolerance or pre-existing diabetes and should prompt urgent referral to the diabetes team.

2.2.2 When treatment was either *not* required, or metformin was required only, in a previous pregnancy, an OGTT should be booked as soon as possible (ideally before 16 weeks gestation) with a follow up OGTT and HbA1c at 24-28 weeks if the first test is normal (NICE 2015). Alternatively, HBGM can be offered from booking.

2.2.3 When insulin *was* required in a previous pregnancy, complete a referral to the diabetes team. The DSM/DSN should offer one of the following in accordance with NICE (2015) guidelines:

- OGTT to be booked as soon as possible (ideally before 16 weeks gestation) with a follow up OGTT and HbA1c at 24-28 weeks if the first test is normal (NICE 2015).
- Early HBGM after booking:
  - Pre-breakfast and 1 hour post meals for 1 week. Results are reviewed remotely by a member of the diabetes team.
  - If the results are normal (pre meal <5.3mmol/L and 1 hour post meal <7.8mmol/L), provide dietary advice and encouraged to continue to

monitor 2 days per week (preferably one day at the weekend and one during the week). An appointment with the DSM/DSN should be made alongside the 20 week anomaly scan to review the HBGM results. A further DSM/DSN review should take place at 24 weeks either remotely or during a scheduled hospital appointment. If HBGM continues to be normal an OGTT and HbA1c will then be arranged to confirm normal glycaemia at 24-28 weeks.

- If above target range (pre meal ≥5.3 mmol/L and 1 hour post meal ≥7.8 mmol/L) three times per week at any time of the day, review in the joint diabetes antenatal clinic and managed accordingly.

2.3 Oral Glucose Tolerance Test

2.3.1 A test should be offered at 24-28 weeks (ideally 26 weeks and no later than 34+0 weeks) gestation. An appointment for an OGTT and HbA1c should be booked by contacting antenatal reception at the respective site.

2.3.2 The procedure should be explained with direction to the online information leaflet.

2.3.3 Provide an appointment and instruct the woman or birthing person not to smoke, eat or drink anything other than plain water from midnight the day prior to her appointment.

2.3.4 Prior to commencing the test, check the above instructions have been followed. If not fasted from midnight (or for a minimum of 8 hours), offer for them to wait until they are or offered another appointment.

2.3.5 **The test should be carried out as follows;**

- Take an HbA1c and fasting venous blood sample for glucose testing.
- Give a 75g carbohydrate load. If using Polycal™ – 113 mL and 87 mL of water = 200 mL.
- After drinking the solution, the woman or birthing person must be asked to remain in the hospital, to not walk around the unit due to the potential to artificially lower the result and reminded not to smoke, eat or drink anything other than plain water.
- After 2 hours, another venous blood sample must be taken.
- Ensure the correct label – fasting or 2 hour – is applied

2.3.6 If the first OGTT appointment is missed, a further OGTT appointment must be sent. If the appointments are missed on two consecutive occasions, an ANC core midwife must contact the woman or birthing person via telephone to offer another appointment. If they decline the test or do not attend the third appointment for an OGTT then routine antenatal follow up will continue. The midwife should discuss the reasons for not attending the previous appointments and encouragement should be given to attend the next appointment if consents.

2.4 In the event that Polycal™ is unavailable take an HbA1c and fasting venous blood sample.

2.5 Diagnostic criteria for GDM

2.5.1 MFT's thresholds for determining the degree of glucose intolerance based on a 75g OGTT are shown below in Table 2. These are not in accordance with the recommendations within the NICE (2015) Diabetes in Pregnancy guidelines but have been agreed locally following review of diagnosis rates and rates of LGA from the Manchester HAPO data. See tables below:

Table 2

HAPO (SMH) n=2396

	%	LGA ≥90th	OR
No GDM (<5.1 & <7.8)	75%	6.5%	Ref
Intermediate fasting only (5.1-5.2, 2h <=7.8)	4.7%	8.9%	1.4 (0.7-2.8)
Intermediate **both** fasting 5.1-5.2, 2h 7.8-8.5	4.3%	9.9%	1.6 (0.9-3.0)
Intermediate 2h only (fasting <5.1, 2h 7.8-8.4)	3.8%	9.9%	1.6 (0.8-3.1)
GDM ≥5.3 or ≥8.5	15.8%	15.1%	2.6 (1.8-3.6)
GDM ≥5.3 or ≥7.8	20.0%	14.0%	2.3 (1.7-3.1)
GDM NICE ≥5.6 or ≥7.8	16.4%	14.8%	2.4 (1.7-3.3)

EITHER FASTING (mmol/l)	AND/OR 2 HOUR (mmol/l)	HbA1c	ACTION
<5.1	**<7.8**	**<41**	Normal results.
5.1-5.2	**7.8-8.4**		Discuss general health and wellbeing information during pregnancy alongside routine antenatal care.
5.3-7.0	**8.5-11.0**	**≥41**	Gestational diabetes Refer to DSM/ DSN. Offer appointment within 1 week (via telephone or letter) to start blood glucose monitoring. See *Section 2.4.*

>7.0	**>11.0**	**≥48**	Gestational diabetes (likely pre-existing diabetes) URGENT referral to DSM/DSN. Offer urgent appointment (via telephone or community midwife visit) to start blood glucose monitoring. See *Section 2.4.*

Table 3

2.6 Referral to diabetes midwives

2.6.1 For those receiving antenatal care at Saint Mary's Oxford Road Campus (ORC) or Lanceburn, the OGTT and HbA1c results are actioned by the antenatal team (diabetes midwives and clinic midwives respectively) within 72 hours. Any abnormal results should be referred to the Diabetes Specialist Midwives who can be contacted at Saint Mary's ORC – telephone 0161 276 6408 (ext. 66408) or ICE referral (Diabetes Specialist Midwifery Service).

2.6.2 For those receiving antenatal care at Saint Mary's at Wythenshawe, the OGTT and HbA1c results are actioned by the antenatal team within 72 hours and abnormal results should be referred to the Diabetes Specialist Midwives at Wythenshawe and should be contacted on 0161 291 2959/291 3291.

2.6.3 For those receiving antenatal care at North Manchester, the OGTT and HbA1c results are actioned by the Diabetes Specialist Midwives.

2.6.4 For those receiving antenatal care at Trafford with a diagnosis of GDM, refer to appropriate diabetes team depending on delivery location.

2.6.5 For those booked in the raised BMI clinic at Saint Mary's ORC, an initial appointment will be made in the joint diabetes clinic for diabetes and dietitian review. Ongoing care will then be provided in the raised BMI clinic. HBGM will be reviewed by the DSM/DSN and transfer to the joint diabetes clinic if insulin therapy is needed.

2.7 Care pathway for GDM

2.7.1 Communication

Members of the multi-disciplinary team (MDT) should work in partnership with women and birthing people. Decisions about care should be holistic and patient-centred and people should be offered the opportunity to make informed choices through the provision of appropriate information

Women and birthing people diagnosed with GDM should be taught how to self-monitor blood glucose by a member of the diabetes team. The targets for blood glucose control are recommended as below but may be individualised based on risk factors (see GDM care pathway *appendix 1*):

- pre-meal glucose: 4-5.2 mmol/l
- 1 hour post-meal glucose: <7.8

Information should be provided regarding options for remote review of HBGM. Invite those in the clinic to use the My Maternity Care app which links to their Manchester Care Record and enables remote review of HBGM and a record of

current treatment (see *My Maternity Care App – home blood glucose and/or blood pressure monitoring during pregnancy* guideline).

2.7.2 **Offer information and advice regarding GDM**

Inform that good blood glucose control throughout pregnancy will reduce the risk of fetal macrosomia (abdominal circumference >97th centile and/or estimated fetal weight >97th centile), trauma during birth (to themselves and baby), induction of labour, caesarean section, neonatal hypoglycaemia, perinatal death, obesity and/or diabetes developing later in the baby's life and the risk of their baby developing type 2 diabetes in the future.

Offer consultation with dietitian for advice on the importance of diet, exercise and weight management for good blood glucose control. Advise to choose, where possible, carbohydrates from low glycaemic index sources, lean proteins including oily fish and a balance of polyunsaturated fats and monounsaturated fats and exercise 30 minutes after meals (NICE, 2015).

Anyone with a BMI of 35 or more can be referred to the Adult Weight Management Service 'Morelife' https://www.more-life.co.uk. This must be completed by a healthcare professional.

Consider referral for Tier 3 Weight management/bariatric services dependant on BMI and co-morbidities postnatally.

2.8 Hypoglycaemic therapy

2.8.1 Consider oral hypoglycaemic therapy with metformin when diet and exercise fails to maintain normoglycaemia over a period of 1-2 weeks. Start with metformin 500mg once daily, titrated up by 500mg every 3 days to achieve a maximum dose of 2.5g daily in divided doses. If significant side effects experienced with metformin, consider metformin SR.

2.8.2 Offer immediate treatment with insulin with or without metformin when fasting is >7mmol/L at diagnosis (NICE, 2015).

2.8.3 Consider immediate treatment with insulin, with or without metformin when fasting between 6.0-6.9mmol/L and ultrasound shows developing fetal macrosomia and/or polyhydramnios at diagnosis (NICE, 2015).

2.8.4 Basal insulin (1st line Humulin I Kwikpen) may be required to obtain 24-hour normoglycaemia. Offer advice on causes of hypoglycaemia and treatment for those taking insulin and provide concentrated oral glucose solution (NICE, 2015).

2.8.5 **Insulin titration** – One to two weekly reviews of blood glucose control (in antenatal clinic/remotely) are advised to achieve blood glucose targets (NICE 2015). Where a doctor or non-medical prescriber has prescribed insulin, within a range of doses, it is acceptable for competent trained registrants to titrate dosages, according to the patient's response to treatment. Give structured education regarding self-monitoring of blood glucose, diet and exercise, fasting, driving rules and the avoidance of, and response to, hypoglycemia, illness and hyperglycemia (see *appendix 4* for titration guidance).

2.9 Antenatal care

2.9.1 **Offer:**

- Referral to a joint diabetes and antenatal clinic at diagnosis in addition to routine antenatal care.
- Tailor contact with the diabetes care team should be tailored to individual needs, at minimum of 4 weekly intervals.
- The GDM care pathway should be attached to the handheld notes (see *appendix 1*).
- HbA1c ≥48mmol/mol at booking should trigger review by a diabetes consultant in the antenatal clinic and considered for diabetes retinopathy screening. Referral may be rejected in cases where there is no diagnosis of pre-existing diabetes.

2.9.2 **Monitoring of fetal growth and wellbeing**

Offer ultrasound every 4 weeks from 28 weeks gestation or at shorter intervals if there are concerns regarding reduced fetal growth. Where there is suspected LGA, and a normal growth trajectory, growth scans do not usually require repeating more frequently than 4 weekly.

2.10 Timetable of antenatal appointments

2.10.1 Specialist care is provided alongside routine antenatal care.

2.10.2 Members of the MDT are available at hospital visits to provide combined diabetes and obstetric care where needed.

2.10.3 Between clinic visits women and birthing people are encouraged to discuss their HBGM results with the DSM/DSN if concerned.

2.10.4 If glycaemic control is good and there are no other obstetric concerns some appointments can be community based.

2.11 Management of Hyperglycaemia in the third trimester

2.11.1 Blood sugar levels of ≥10mmol/l can have an adverse impact on the fetus and in the third trimester, if this is sustained, will require continuous fetal monitoring until blood glucose <10mmol/L is achieved. Advise that frequent excursions in blood glucose>10mmol/L is associated with stillbirth.

2.11.2 Advise that if one blood sugar reading is ≥10mmol/L on HBGM recheck 1 hour later and that physical exercise can help to lower blood sugar in the interim period. If blood sugar remains ≥10mmol/L, advise to make contact with triage for fetal monitoring and assessment.

2.11.3 If at presentation to triage there has been a prolonged period of hyperglycaemia and blood glucose >10mmol/L on admission, consider commencing an Obstetric VRIII (see *Diabetes: Obstetric Variable Rate Insulin Infusion in the Antenatal/Peripartum Period (including steroid administration and supplementary sliding scale)* guideline) and review by the diabetes team.

2.11.4 If ketonuria present and blood sugar ≥11mmol/L, see local diabetes ketoacidosis guideline. Where possible check for blood ketones.

2.12 Corticosteroids for suspected preterm delivery

See *Diabetes: Obstetric Variable Rate Insulin Infusion in the Antenatal/Peripartum Period (including steroid administration and supplementary sliding scale)* guideline.

Steroids should be routinely offered where birth is anticipated before 34+6 weeks, but given the risk of hyperglycaemia, the need for steroids must be discussed with a consultant obstetrician. Regardless of the anticipated mode of birth, between 35-36+6 weeks, steroids should not be routinely prescribed. The risks and benefits of antenatal steroids between 35-36+6 weeks should be discussed with the parents and prescribed in line with their wishes. After 36+6 antenatal steroids should not be routinely offered.

2.13 Plan for delivery

2.13.1 A plan for delivery should be discussed by the MDT in the third trimester. Timing of delivery will take into account individual factors, obstetric history, glycaemic control and fetal size. Aim for delivery by 40^{+6} weeks in the absence of any obstetric concerns.

2.13.2 In pregnancies where the AC is >97th centile and/or EFW >97th centile, counsel about the increased risk of intrapartum complications including emergency caesarean section, shoulder dystocia, perianal trauma and postpartum haemorrhage.

See *Large for gestational age fetus* guideline

2.13.3 If the EFW is >4kg or >4.5kg, the risk of shoulder dystocia is likely to be 5% and 14%, respectively, and a discussion regarding mode of delivery should be carried out.

2.14 Intrapartum care

2.14.1 Spontaneous Labour

- Women and birthing people with diet controlled GDM and no other obstetric risk factors should have a capillary blood glucose performed on initial presentation in established labour. If ≤8 mmol/L offer midwifery led care, which can be provided on the Midwifery Led Unit or Obstetric Led Unit, with no further blood glucose monitoring needed in labour. If >8mmol/L, care should be provided on the Obstetric led unit as below;
    - If on treatment, continue normal insulin/oral treatment regime until in established labour.
    - Stop long acting and mealtime insulin once in established labour as may cause hypoglycaemia once delivered.
    - During labour perform 2 hourly capillary blood glucose levels, using a trust point of care, meter aiming to maintain levels between 4.0 – 7.0 mmol/l.
    - If blood glucose above 7mmol/l repeat test in 30 minutes. If two consecutive results above 7mmol/l commence sliding scale insulin (see *Diabetes: Obstetric Variable Rate Insulin Infusion in the Antenatal/Peripartum Period (including steroid administration and supplementary sliding scale)* guideline).
    - If delivery is imminent a sliding scale insulin infusion is not mandatory.

2.14.2 **Induction of Labour**

- If diet controlled GDM and initial blood glucose is ≤8mmol/L at the onset of established labour, no further testing is needed during intrapartum care.
- If on treatment, continue normal insulin/oral treatment regime until transferred for intrapartum care. Following transfer, manage diabetes as for spontaneous labour.

  See *Induction of Labour* guideline.

2.14.3 **Specific Obstetric Points**

- Secondary arrest of labour must be discussed with the on-call consultant obstetrician or ST6-7 Trainee as unexpected macrosomia may be present.
- An experienced obstetrician (ST3 or above) should be present at delivery if there is suspected macrosomia.
- An oxytocin infusion should only be used with extreme caution and after discussion with the on-call consultant obstetrician in cases of delay in established labour in multiparous women and birthing people.

2.14.4 **Elective Caesarean Section and GDM**

- Do NOT advise to eat a high-carbohydrate meal the night prior to caesarean section. Normal diabetic dietary advice applies.
- The elective caesarean section should be done first on the morning caesarean section list.
- Diabetes team will reduce night-time long-acting insulin the day prior to surgery. If no documented reduction, reduce night-time insulin by 25%.
- No insulin is required for gestational diabetics on the day of surgery, or postnatally, unless otherwise specified.
- Following admission CBG should be checked hourly. If CBG <4mmol/L then follow the hypoglycaemia guideline. If > 7mmol/L on two occasions 30 mins apart then commence Obstetric VRIII (see *Diabetes: Obstetric Variable Rate Insulin Infusion in the Antenatal/Peripartum Period (including steroid administration and supplementary sliding scale)* guideline).

2.15 Postpartum Care

2.15.1 Insulin/oral hypoglycaemic treatment should be stopped immediately after the delivery of the placenta.

2.15.2 Advise that blood sugars need to be tested pre breakfast and one hour after each meal as a minimum. This will be carried out by the midwife via POCT meter.

2.15.3 If blood glucose levels abnormal (pre meal ≥7mmol/L and/or 1 hour post meal ≥10mmol/L) in the first 24 hours post-delivery continue testing and inform the diabetes team.

2.15.4 For neonatal care see the guideline for *Hypoglycaemia prevention and Thermoregulation following Birth*.

2.15.5 Prior to discharge, the midwife responsible for the discharge must make every effort to ensure that a letter has already been sent to the GP requesting that a 6–13 week appointment arranged for a fasting plasma glucose test and HbA1c (see *appendix 3*).

2.15.6 Encourage yearly HbA1c checks via the GP's annual Type 2 Diabetes screening programme. Referral by GP to the Healthier You NHS Diabetes Prevention Programme can also be completed.

2.15.7 Consider hospital follow up with repeat OGTT where HbA1c ≥48, fasting plasma glucose >7mmol/L and/or 2-hour plasma glucose >11mmol/L.

2.16 Postnatal Advice

On diagnosis, and postnatally, advise to/of;

- Maintain a healthy diet, exercise and normal weight to reduce the risk of future Type 2 diabetes.
- Increased risk of GDM in future pregnancies
- Symptoms and management of hyperglycaemia.
- Increased risk of obesity and diabetes in siblings.
- Necessity for annual lifestyle review and HbA1c blood test with GP.
- Importance of appropriate contraceptive measures if not planning pregnancy
- If planning pregnancy, need for HbA1c prior to conception

2.17 Breast feeding

2.17.1 Antenatally, midwives should offer support with colostrum harvesting. Every effort should be made to ensure that diabetic mothers and people, who wish to breastfeed, are taught to hand express and store their colostrum in the antenatal period. Packs are available in the diabetic clinic. See local infant feeding guideline. This helps to reduce the risk of neonatal hypoglycaemia and is appropriate when a preterm delivery is imminent, from 37 weeks onwards, or prior to induction of labour.

2.17.2 During the induction or labour process, offer support with colostrum harvesting and storage.

2.17.3 Breast feeding must be encouraged with diabetes to reduce the risk of diabetes in the offspring. Advise to feed baby within 30 minutes of birth and every 2-3 hours thereafter in the first 24 hours to prevent neonatal hypoglycaemia (NICE 2015). Check baby's blood glucose pre-feed 2-4 hours after birth for neonatal hypoglycaemia.

3. Communication & Documentation

All women and birthing people with learning disabilities, visual or hearing impairments or those whose first language is not English must be offered assistance with interpretation

where applicable, and where appropriate a telephone interpreter must be used. It is paramount that clear channels of communication are maintained at all times between all staff, the women and birthing people and their families. Once any decisions have been made/agreed, comprehensive and clear details must be given to the woman or birthing person thereby confirming the wishes of them and their families.

The contents of any leaflet issued must be explained in full at the time it is issued. All communication difficulties (including learning difficulties) and language barriers must be addressed as outlined in the previous paragraph at the time the leaflet is issued.

Ensure the provision and discussion of information of the risks and benefits during the antenatal, intrapartum and postnatal periods.

Staff should aim to foster a culturally sensitive care approach in accordance with the religious and cultural beliefs of the parents and families in our care.

4. Equality, Diversity and Human Rights Impact Assessment

The EqIA score fell into low priority (0-9); no significant issues in relation to equality, diversity, gender, colour, race or religion are identified as raising a concern.

5. Consultation, Approval and Ratification Process

During development this guideline has been reviewed by senior obstetricians, diabetologists, dieticians, anaesthetists, and midwives from Wythenshawe, ORC and North Manchester. It has been ratified by the Site Obstetric Quality and Safety committee, the North Manchester Guideline Committee and the Medicines Management Committee.

It will be formally reviewed 3 years following its ratification or sooner if there are significant changes in evidence-based practice.

6. References

Association and the European Association for the Study of Diabetes (2015) *Diabetes Care*. 38:140-149 [adapted].

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Royal College of Nursing. Starting injectable treatment in adults with type 2 diabetes (2012): RCN guidance for nurses. National Institute for Health and Care Excellence. Type 2 diabetes in adults: management. NG28. 2015

Nursing and Midwifery Council (2008) The Standards for Medicines Management Standard 13, 2007 (p46). Nursing and Midwifery Council Code of Professional Conduct.

7. Appendices

Appendix 1: GDM care pathway
Appendix 2: Diabetes team contact details
Appendix 3: GP Letter
Appendix 4: Insulin titration guidance

NHS
Manchester University

Appendix 1: GESTATIONAL DIABETES:
ANTENATAL CARE PATHWAY

Affix patient label

EDD :

Blood sugar target: general rule: x3 pre ≥5.3 OR x3 post ≥7.8 within one week will prompt treatment initiation/change.

Discussion **Glucose targets / importance of control**	**Date**	**Sign**
HBGM diary/Meter demonstrated/Timing of tests/ BG Meter/QC test		
Fetal risks (macrosomia, shoulder dystocia, neonatal hypo, SB)		
Insulin – type of insulin, sharp disposal, pen demonstrated, hypoglycaemia (<4.0), injection sites, storage, sick day rules, driving (5.0 to drive)		
Stop treatment at delivery/BM monitoring pre-meal 24hours/breastfeeding		
Follow up FBG/OGTT/Future risk (GDM/Type 2)		
Dietitian Review		

Blood sugar levels of >10mmol/l can have an adverse impact on your baby. If one blood sugar reading is 10mmol/L or above recheck 1 hour later. If it remains >10mmol/L contact triage for fetal monitoring and diabetic team follow up.

Gestation at Diagnosis		
Early OGTT (prev GDM)	**Fasting**	**2 hr**
GTT	**Fasting**	**2 hr**
HBGM	**Yes / No**	
HbA1C Result		

Titrating Metformin (Max daily dose 2.5g) **Start date:**

Metformin is a safe and effective treatment for you and your baby. It makes your body more sensitive to the insulin your produce naturally which helps to normalise blood sugar levels without the risk of them going too low. Some may find metformin causes nausea, indigestion, diarrhoea or loss of appetite. If this happens after increasing your metformin go back down to the dose you tolerated well and contact the diabetic team.

Day 1	**Day 4**	**Day 7**	**Day 10**	**Day 13**
500mg evening meal	**500mg breakfast & evening meal**	**500mg breakfast 1g evening meal**	**1g breakfast & evening meal**	**1g breakfast & evening meal 500mg lunch**

Insulin Start **Start Date:**

Insulin Type: Long acting: Start on ……units

Short acting: Start on ……units

Titrate up as per protocol by 10-15% or 2-4 units once or twice a week until target blood glucose levels reached.

Appendix 2: Diabetes team contact details

Name	Role(s)	Ext	Bleep or pager
For women and people attending Saint Mary's on Oxford Road Campus/Lanceburn			
Jenny Myers	Consultant Obstetrician	16963	Vocera or mobile via switchboard
Melissa Whitworth	Consultant Obstetrician	16955	Vocera or mobile via switchboard
Kim MacLeod	Consultant Obstetrician	10055	Vocera or mobile via switchboard
Sarah Hamilton	Consultant Obstetrician	10051	Vocera or mobile via switchboard
Shimma Rahman	Consultant Obstetrician	11322	Vocera or mobile via switchboard
Teresa Kelly	Consultant Obstetrician	10008	Vocera or mobile via switchboard
Emma Shawkat	Consultant Obstetrician		Vocera or mobile via switchboard
Sarah Steven Clare Mumby	Consultant Diabetologists	66716	Mobile via switchboard
Gretta Kearney Susan Quinn Helen Burns Coleen Jennings Katie Kinney	Diabetes Specialist Midwives	66408	07659 502115 08659 502115
Jayne Hince Alexander Sims	Diabetes Specialist Nurse	63256	07970408364
Emma Hyland	Dietitian	66700	Not available
As rotation	Diabetes Registrar	NA	2007 & 2014
For women and people attending Saint Mary's at Wythenshawe			
Akila Anbazhagan	Consultant Obstetrician		01612914305
Andrea Pilkington	Consultant Obstetrician		01612912954
Basil Issa	Consultant Diabetologist		01612912589
Kelly Cheer	Consultant Diabetologist		01612914377

Jodie Aspinall	Diabetic Specialist Midwife		01612912959/ 01612913291
Catherine Head	Dietitian		01612915089
Donna Stenson Kathryn McGladdery	Diabetes Nurse Specialist		01619458203/ 01612915089
For women and people attending North Manchester			
Siobhan Ferguson	Consultant Obstetrician		Mobile via switchboard
Vila Arul-Devah Hemantha Chandrasekara	Consultant Diabetologists		Mobile via switchboard
Liz Crotty Emma Croucher	Diabetes Specialist Midwife	42124	07971078529
Rachael Baxter	Diabetes Specialist Nurse	44879	07811024625
(no name as we are getting new dietitian)	Dietitian	43139	

Manchester University
NHS Foundation Trust

Appendix 3: GP Letter

Date:

Dear Doctor

Re:

The above patient's baby is due on……..Her/Their pregnancy is complicated by Gestational Diabetes (GDM).

As you know GDM is a major risk factor for GDM in future pregnancies and also for progressing to type 2 Diabetes Mellitus.

Therefore, it is recommended to:

1. Check her/their fasting blood glucose at 6-13 weeks postpartum. If this has not been performed by 13 weeks, offer a fasting blood glucose test or a HbA1c. Please arrange her/their appointment.
2. Continuing ongoing practice support for a sustained healthy lifestyle (exercise, food portions, food composition and weight management).
3. Schedule an annual review of lifestyle and fasting blood glucose and HbA1c.
4. Provide a prompt referral to maternity services/the diabetes specialist midwives for any future pregnancies.
5. Consider referral to bariatric services if BMI> 35 as this has been shown to improve glycaemic control and reduces or delays progression to type 2 Diabetes Mellitus.
6. Consider referral to the Healthier You NHS Diabetes Prevention Programme.

Yours sincerely

Diabetes Specialist Midwife

Cc
Patient

Appendix 4 - Insulin titration guidance

1. Insulin should be prescribed as a flexible dose with a range and documented in the medical notes that doses should be titrated according to blood glucose monitoring results.

2. Insulin should only be titrated by appropriately trained/experienced staff within the diabetes team

3. Insulin doses should not be titrated in response to one single high or low result. The blood glucose diary of results (4 day pattern) should be used to see trends in levels and the doses titrated appropriately.

4. Consider the type (short acting or long acting) of insulin and dose before titrating.

5. Preventing severe hypoglycaemia should be priority over correcting hyperglycaemia.

6. Review the blood glucose result at next section of the day following insulin injection before titrating dose. Examples:

    - Check the fasting blood glucose when titrating the bedtime basal insulin.
    - Check the pre-lunch blood glucose when titrating breakfast bolus insulin.
    - Check the pre-evening meal blood glucose when titrating lunch bolus insulin.
    - Check the before bed blood glucose when titrating the evening meal bolus insulin.

Basal Insulin titration

Adjust upward dose by 10-15% or **2-4 units** once or twice weekly until target blood glucose levels reached. The normal titration rule is 2units.

If hypoglycaemic determine and address cause: reduce corresponding dose by 2-4 units or 10-20%.

Rapid or short acting insulin titration

Adjust upward dose by 10-15% or **1-2 units** once or twice weekly until target blood glucose levels reached. The normal titration rule is 2units.

If hypoglycaemic determine and address cause: reduce corresponding dose by 2-4 units or 10-20%.