Guideline

Screening for diabetes in pregnancy, the glucose tolerance test (GTT) and management of women in pregnancy with abnormal GTT requiring dietary or insulin / hypoglycaemic agent management

1 Scope

Local: This document is aimed at midwives, obstetricians and the Diabetes in Pregnancy Team caring for women with diabetes in pregnancy within Maternity Services. It is applicable to all women booking for care at the Rosie Hospital without pre pregnancy glucose intolerance or diabetes mellitus.

The Diabetes in Pregnancy Team consists of:

- consultant diabetologist
- consultant obstetrician with special interest in diabetes
- diabetes specialist nurse
- dietitian with training in diabetes care
- diabetes specialist midwife.

2 Purpose

The aim of screening in pregnancy for diabetes is to establish whether a woman has developed gestational diabetes mellitus (GDM) and to screen for previously undetected diabetes mellitus, or impaired glucose tolerance.

3 Abbreviations used

AFI	amniotic fluid index
BMI	body mass index
CTG	cardiotocograph
EDD	expected date of delivery
GDM	gestational diabetes mellitus
GTT	glucose tolerance test
HISS	hospital information support system
SBGM	self blood glucose monitoring

4 Screening for diabetes and impaired glucose tolerance

4.1 Booking

All women without pre-existing diabetes should be offered a random venous blood glucose test at booking. If blood glucose levels >7.0 mmol/l, a 75g oral glucose tolerance test (GTT) should be advised and arranged. A standard letter detailing instructions for the woman should be sent by the clinic midwife. Women who decline screening for gestational diabetes should be advised that this is locally recommended guidance and the discussion; the fact that the woman has declined should be documented in the hand held notes. ✓

4.2 28 weeks

The 28 week blood tests should include a 50g non fasting glucose **challenge** test. Process of test: ✓

- Drink 273mls of standard Lucozade (this is equivalent to 50 grams of glucose) one hour before venous blood is taken for glucose measurement.
- Nothing should be eaten or drunk for the hour between the glucose load and the blood test.
- If there is a venous blood glucose level >7.8mmol/L, then a full glucose tolerance test (GTT) should be arranged via the Phlebotomy Department at the Rosie Hospital (extension 3665).

4.3 Indications for a GTT in pregnancy

In summary, the following women are advised to attend for a GTT:

- random blood glucose > 7.0 mmol/l
- 50g non-fasting glucose challenge at 28 weeks > 7.8 mmol/l
- polyhydramnios in the current pregnancy
- estimated fetal weight above 97th centile
- fetal abdominal circumference above 97th centile
- previous pregnancy with diagnosis of gestational diabetes (GTT at 16/40 and if normal repeat at 28/40)
- women with a BMI of greater than 30 at booking (GTT at 28 weeks) **B**
- women with a previous baby >4.5kg (in the absence of GDM) (GTT at 28 weeks)
- where requested by a consultant obstetrician when there are none of the above risk factors present.

4.4 GTT procedure (fasting 75 gram glucose test)

In preparation, the woman:

- must fast from 2200 hours on the day before the test
- must refrain from smoking and excessive exercise during the test
- should endeavour to eat a healthy diet during the three days prior to the test
- may take a few sips of water to take essential medication (no antacids), or if she is very thirsty.

On the day of the test:

- The woman must attend the Rosie Hospital Phlebotomy room on the day of the appointment between 0830 and 0930 (test will take two hours).
- clinic midwife to check a fasting capillary sample if previous result above 10.0mmol/l (if this result is above 7.0 mmol/l then advice should be sought from the Diabetes in Pregnancy Team before proceeding).
- Samples are obtained from venous blood and labelled according to the time from the 75 gram glucose load. The first sample should be obtained pre glucose load and labelled: 'Sample 1 - fasting level.' The woman should then drink the glucose solution and the time of ingestion should be recorded.
- A venous sample for fasting cholesterol and triglycerides should be taken with the first sample.
- The second venous blood sample is taken 60 minutes following ingestion and labelled 'Sample 2 - 60 minutes.'
- The third sample is taken at 120 minutes and labelled 'Sample 3 - 120 minutes.'

All samples are placed with the request form in a sample bag and sent to the laboratory for testing as soon as possible after completion of the test. Yellow topped fluoride blood collection tubes should be used. Capillary samples may be taken if it will be difficult to obtain venous blood on the x3 required occasions.

On completion of the test the woman should be advised to have something to eat before proceeding home. She will also be told how she will receive the results.

The results are reviewed within 48 hours by the diabetes specialist midwife and, if normal, the woman is informed by letter.

4.5 Abnormal GTT results

An **abnormal** result based for a venous sample is:

- fasting value >6.0 mmol/l
- a 120 minute value >7.7mmol/l

An **abnormal** result for a capillary sample is:

- fasting value >6.0 mmol/l
- a 120 minute value >8.8mmol/l

If abnormal the woman is invited to the next available Diabetes in Pregnancy Clinic (HISS code: PREGD NRET).

5 Management of women referred with abnormal GTT

Following diagnosis, the woman will be seen in Tuesday's combined Diabetes in Pregnancy Clinic. The lead obstetrician should be clearly documented on the front of the hand held notes and on the pink divider in the main notes if the woman has previously been under midwifery-led care. The woman should be informed that she is now classed as requiring 'high risk care' and that she will have the opportunity to discuss her care with the obstetric and diabetes consultant following her diagnosis, at the earliest availability. Follow-up will be every 1-4 weeks dependant on need, with telephone advice as necessary.

Plans for delivery will be documented on the intrapartum schedule by both components of the team: obstetric and diabetic.

5.1 Points to cover at first visit following diagnosis of GDM

- Issue glucometer and demonstrate technique for self blood glucose monitoring (SBGM).
- Give woman GP letter to inform of diagnosis and request blood glucose testing strips/ lancets.
- Discuss safe disposal of sharps/ testing strips.
- Issue the *Gestational Diabetes* information leaflet.
- Take blood sample for HbA1c (glycosolated haemoglobin).
- Take urine sample for albumin/ creatinine ratio.
- Record weight of woman.
- Dietitian to take dietary history and issue dietary advice.
- Discuss blood glucose targets:
    - BMI below 30 at booking = fasting between 4.0 and 5.5mmol: one hour post prandial <7.8mmol
    - BMI above 30 at booking = fasting level between 4.0 and 5.5mmol: one hour post prandial level <7.0mmol

- Issue blood glucose diary, explain how to document and highlight contact numbers for support.
- Discuss/ explain the process of the condition of GDM and good health measures for the future.
- The woman should be informed of the increased risk of developing diabetes in the future following the diagnosis of gestational diabetes.
- Encourage the woman to take some daily exercise (ideally 30-60 minutes) dependant on her condition.
- Explain scan schedule (table 1) and obstetric review process.
- Make appointment for review in one week by the Diabetes in Pregnancy Team
- Make appointment for postnatal GTT: based on EDD.
- Complete clinic episode page in hospital notes documenting the above care. ✓

For management of women on insulin, see the Trust's high risk antenatal guideline 1.48: antenatal care for women requiring insulin during pregnancy.

5.2 Scanning schedule

The table below lists the routine scans that should be performed for women with abnormal GTT.

Table 1: Scan schedule

Timing	Place	Purpose	Investigations
32 weeks	Rosie Hospital Scan Department / Clinic	Assess fetal growth/ wellbeing Review by Diabetes in Pregnancy Team (multidisciplinary)	Scan: Growth/ AFI Dopplers
36 weeks	Rosie Hospital Scan Department / Clinic	Assess fetal growth/ wellbeing Review by Diabetes in Pregnancy Team (multidisciplinary) Diabetes and obstetric plans should be documented on the intrapartum plan and filed in the woman's hospital notes	Scan: Growth/ AFI Dopplers
40 weeks	Rosie Hospital Scan Department / Clinic	Assess fetal growth/ wellbeing Review by obstetric members of Diabetes in Pregnancy Team	Scan: Growth / AFI Dopplers

Women diagnosed with GDM before 28 weeks should have an additional scan for growth and AFI at 28 weeks. Women diagnosed after 32 weeks should be allocated to the next most appropriate scan and obstetric review.

A CTG needs to be performed only if there is cause for concern during the scan ie reduced fetal movement, abnormal Dopplers, or any other concern for fetal or maternal wellbeing.

5.3 Ongoing care

Women will be seen each 1-4 weeks following diagnosis. At each visit they will see members of the diabetes team ie diabetes consultant/ registrar and diabetes specialist nurse/ dietitian and/or the specialist midwife at the same time. Following each scan appointment the case will be reviewed by a member of the obstetric team. Due to the geography of the department and the joint nature of the clinic, there is opportunity to discuss cases jointly or invite different members of the teams (obstetric and diabetes) to joint consultations with the woman as required or deemed appropriate.

Women should be considered to require treatment if blood glucose levels are out of target range on three or more occasions within a week (see table 2 below).

Table 2: Target for blood glucose levels

Time	Blood glucose level mmol/L
Fasting	Less than 5.5
One hour after meal	Less than 7.8
One hour after meal (if BMI greater than 30 at booking)	Less than 7.0

On commencement of insulin therapy, the diabetes specialist nurse/ midwife should advise the woman on:

- the use of insulins and pen devices
- management of hypoglycaemia
- vehicle driving
- disposal of sharps.

The risks and benefits of Metformin will be discussed with the woman by the diabetes consultant if this hypoglycaemic agent is considered to be the most useful drug of choice.

Note: There should be increased surveillance where there is an indication of previously undiagnosed diabetes, regardless of what treatment is required. The care for these women should follow guideline 1.48: antenatal care for women requiring insulin during pregnancy.

5.4 Antenatal admission for any obstetric reason

1. Contact a member of the Diabetes in Pregnancy Team (messages may be left: extension 6901/3657 or 58780)

2. Ensure meal provision is suitable for women with diabetes. Consideration should be given to ensuring women are able to select appropriate choices from the menu. Advise the allocated dietitian of woman's admission.
3. Blood glucose should be monitored pre-breakfast and one hour after all main meals and documented on the blue Addenbrooke's diabetes chart.

5.5 Timing of delivery

For women on diet control only with normal growth and liquor volume, induction should be discussed between 38 and 40 weeks of pregnancy. The woman's preferences should be considered and she should be counselled for the risk of stillbirth. Timing of delivery will be individually assessed. Those women with babies of normal growth parameters and remaining on dietary treatment alone may be considered for routine post-dates care management.

There is no direct evidence for the benefit of early delivery in cases of fetal macrosomia, however there should be consideration for delivery from 38 weeks if there is evidence of accelerated growth of the fetus.

6 Postnatal follow-up

Following the birth, blood glucose monitoring should continue for 24 to 48 hours. Women should be advised to continue with a normal healthy diet.

Early breast feeding of the baby is recommended. Neonatal blood glucose monitoring should be undertaken as per high risk neonatal guideline 4.13: postnatal ward management of term (>37weeks) infants born to mothers with Type 1 or 2 diabetes or with any form of gestational diabetes (GDM). For management of suspected neonatal hypoglycaemia see the Trust's high risk neonatal guideline.

A repeat GTT for the mother should be arranged at six weeks postnatal. The results will be reviewed by the diabetes specialist midwife.

- Those with **normal** results will be sent a letter confirming the normal result and a letter will also be sent to the GP.
- Those with **abnormal** results will be seen by the diabetes component of the Diabetes in Pregnancy Team.

A letter will be sent to the GP following this visit detailing individual recommendations. The woman should also have her postnatal review with her GP at six weeks postnatal.

7 Monitoring compliance with and the effectiveness of this document

The use and effectiveness of this document will be monitored, either continuously or on an ad-hoc basis, through the following processes:

- meetings of the diabetes multidisciplinary team
- risk management
- clinical audit
- individual patient case reviews
- user/ clinician feedback
- patient complaints
- observation of practice
- midwifery supervision.

Results will be fed back to the lead midwife for diabetes, who will consider review, and initiate change(s) to the document and/or practice, as appropriate.

7.1 Audit standards

1. All women without pre-existing diabetes should be offered:
   - a random venous blood glucose test at booking
   - a 28/40 50g non fasting glucose **challenge** test (see section 4.2).
2. A 75g oral glucose tolerance test (GTT) should be advised and arranged:
   - if blood glucose levels on random testing at booking are >7.0mmol/l
   - if blood glucose levels > 7.7mmol/l at 28/40 following the glucose challenge test
   - for the other indications listed in section 4.3.
3. Women declining diabetes in pregnancy screening should have this documented in their hand held notes.
4. Women admitted to hospital antenatally with an abnormal GTT in pregnancy should be seen by the dietitian on the ward.
5. Ultrasound scans should be performed as detailed in table 1.

8 References

See the Trust's high risk antenatal guideline 1.48: antenatal care for women requiring insulin during pregnancy, references section.

9 Associated documents

- 1.48: antenatal care for women requiring insulin during pregnancy guideline
- 4.13: postnatal ward management of term (>37weeks) infants born to mothers with Type 1 or 2 diabetes or with any form of gestational diabetes (GDM) guideline

Equality and diversity statement

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Document management

Document control / change history					
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Draft 2	K Stubbington, S Dinneen, Prof G Smith	As above	July 2003		
Draft 3	K Stubbington	As above	Feb 2007	C Patient, Obstetrician; A Wilson, Obstetrician; C Strey, Locum Consultant Diabetologist; K Davenport, Specialist Clinical Nurse; Policies & Procedures Group (Maternity); Obstetric Divisional Group; D Simmons, Consultant Diabetologist	Several small changes including capillary GTT changed to venous. NICE guidance awaited.
Draft 4	K Stubbington	As above	Mar 2010	C Patient & A Wilson, Obstetricians; D Simmons Consultant Diabetologist; H Murphy, Honorary Consultant; K Davenport, Diabetes Specialist Lead Nurse; M Hales, Diabetes Specialist Nurse; C Byrne, Diabetes Specialist Nurse; J Grisoni; N Gooding, Pharmacist; Policies & Procedures Group (Maternity); Perinatal Services Management Group	Different blood glucose targets for obese women made. Process at diagnosis of GDM clarified. GTT now to be done for women with BMI>30 (previously 35)

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