The term gestational diabetes mellitus (GDM) is restricted to women in whom the onset or recognition of diabetes mellitus first occurs during pregnancy. Women with glucose intolerance during pregnancy have an increased lifetime risk of developing diabetes mellitus in later life, as well as there being an increased risk of macrosomia and neonatal hypoglycaemia in the baby.

The oral glucose tolerance test (GTT) is used in the investigation of GDM. 75g of anhydrous glucose (or its equivalent) in a final volume of 300 mL is used as recommended by the WHO Expert Committee on Diabetes Mellitus. HbA1c is contraindicated for diagnosis of diabetes in pregnancy.

All glucose values in this document refer to venous plasma glucose levels. Glucose results obtained from “near patient” testing strips should not be used in the diagnosis of gestational diabetes.

INDICATIONS

General population screening (for all pregnant women irrespective of risk factors):
If a woman is found to have 1+ glycosuria on more than 1 occasion or 2+ glycosuria once at routine antenatal testing, then a GTT is indicated. If the GTT is normal, then further OGTTs are not needed for further glycosuria unless there are additional risk factors or the level of glycosuria increases.

After 34 weeks gestation, new glycosuria is unlikely to be due to elevations in blood glucose as HPL levels would have been expected to have reached their peak, a borderline GTT may be hard to interpret as the normal glucose range is not known for this gestation, and diabetes intervention is unlikely to influence outcome of the pregnancy at this late gestation. Therefore unless there are additional obstetrics concerns suggestive of elevations in glucose (e.g. accelerations in growth or polyhydramnios), a GTT is not recommended.

Risk Factor Screening (Indications for GTT at 24-28 weeks)
- Family history of diabetes in one first (parents or siblings) or two second degree (uncle, aunt, grandparent) relatives (on woman’s side; partner’s family history is not relevant)
- Previous macrosomia (term weight ≥4.5kg)
- Previously unexplained stillbirth
- * BMI > 30 in first trimester/at booking
- Previous gestational diabetes

Extra screening for GTT if clinically indicated up to 34 weeks
- Abdominal circumference (AC)>95th centile, or significant growth acceleration of AC in present pregnancy
- Ultrasound diagnosed polyhydramnios
CONTRAINDICATIONS
None

SIDE EFFECTS
Occasionally nausea, vomiting or diarrhoea as the glucose drink is hyperosmolar.

PREPARATION
Planning
A GTT in pregnancy is an outpatient procedure carried out jointly between the Antenatal Unit and the Phlebotomy Department at RDH. A GTT can be performed Monday to Friday morning by appointment with the Antenatal Unit.

Patients using this service may be either:
a) Already booked in at the Antenatal Clinic
b) Referred by their Midwife/GP

A GTT in pregnancy can be carried out at Clinic F at the LRCH but where possible, it is preferable that the patient has the test at the Antenatal Unit.

Patient
The patient should have a normal diet containing more than 150g carbohydrate daily for three days prior to the test.

Guide to the carbohydrate content of some common foods:

<table>
<thead>
<tr>
<th>Food item</th>
<th>Approximate carbohydrate content (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Slice of bread</td>
<td>10</td>
</tr>
<tr>
<td>Tablespoon of rice</td>
<td>12</td>
</tr>
<tr>
<td>Egg sized potato</td>
<td>10</td>
</tr>
<tr>
<td>2 Weetabix</td>
<td>30</td>
</tr>
<tr>
<td>Packet of crisps</td>
<td>15</td>
</tr>
</tbody>
</table>

All medication the patient is receiving should be noted on the request form.

The patient should fast from 10.00 p.m. the previous evening to give a minimum 10 hour fasting period. Water is permitted. The procedure should start between 8.30 am and 10.00 am.

Equipment
Either a) Polycal
This is a carbohydrate drink based on maltodextrin, a partial hydrolysate of corn starch. It is supplied by Cow and Gate in 200 mL bottles. Only 113 ml is required for each patient. This is equivalent to 75g anhydrous glucose. If 3 patients are being tested 2 bottles are sufficient.
Measure 113 mL Polycal into a special beaker, add water up to 200 mL mark. Secure plastic cap firmly onto beaker, shake to mix. Polycal is now ready.

Note: A further 100 mL of water must be drunk by the patient to make the final volume 300 mL.
Or

b) **Dextrose**
Glucose - dissolve 1 packet of dextrose (82.5g glucose monohydrate) in 250 mL water, this gives a final volume of 300 mL. This is equivalent to 75g anhydrous glucose. The dextrose is lemon flavoured to make it more palatable. Chemical Pathology, RDH obtains the glucose from pharmacy and provides supplies for GPs. Note: “Glucose BP” is glucose monohydrate.

c) **Specimen tubes required**
Each test requires two fluoride/oxalate (grey top) tubes.

**Note that:** if the woman is allergic to lemon flavour, lucozade can be used as an alternative. For 70kcal/100ml, 410ml contains the required 75g Glucose. Until the end of 2017, 73kcal/l strength will also be available, and 394ml is needed for a GTT.

**PROCEDURE**

a) A fasting venous blood sample (minimum volume 1 mL in a fluoride/oxalate tube) is taken.

b) The Polycal drink is given and should be taken within five minutes followed by 100 mL of water. This is time “0 hours”.

c) At 2 hours after taking the Polycal drink, a venous blood sample (minimum volume 1 mL in a fluoride/oxalate tube) is taken.

d) Samples must be clearly labelled with the patient’s name, date and the time the sample was taken.

The patient may drink additional water during the test and should be seated quietly throughout the test. Smoking or eating is not permitted during the test. The test is completed when the 2 hour blood sample has been collected.

**INTERPRETATION**
The interpretation of GTT results in pregnancy is shown below:

<table>
<thead>
<tr>
<th>Fasting Glucose mmol/L</th>
<th>2 Hour Glucose mmol/L</th>
<th>Diagnosis</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5.6</td>
<td>and</td>
<td>&lt;7.8</td>
<td>Normal</td>
</tr>
<tr>
<td>≥5.6</td>
<td>and/or</td>
<td>≥7.8</td>
<td>Gestational diabetes</td>
</tr>
</tbody>
</table>
REFERENCES

• Diabetes and Pregnancy guideline OBS/Diabetes/04:16/D1

Authors: Biochemistry Standard Clinical Guideline Group, October 1995

<table>
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<tr>
<th>Reviewed by:</th>
<th>Date:</th>
<th>Expiry date:</th>
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<tbody>
<tr>
<td>Dr P King, Mrs H Seddon</td>
<td>July 2017</td>
<td>31st July 2020</td>
</tr>
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