MANAGEMENT OF DIABETES MELLITUS (DM) IN PREGNANCY
TYPE 1, TYPE 2 AND GESTATIONAL DIABETES (GDM), CLINICAL GUIDELINE. V1.0
1. **Aim/Purpose of this Guideline**

To provide guidance to Midwives, Obstetricians and the Joint Obstetric/Diabetes Team on the management of a pregnant woman with Type 1, Type 2 and Gestational Diabetes.

2. **The Guidance**

2.1. The **Multidisciplinary Team**

All women with Diabetes (either Type 1 or Type 2) should book with their own Community Midwife who will continue to see the woman in the normal way throughout pregnancy.

In addition to this they will also have contact with the Diabetes Specialist Midwife, and will be seen in the Joint Diabetic Antenatal Clinic (ANC) which is run by the, Diabetes Consultant/Endocrinologist and, the designated Obstetrician. The multidisciplinary team also includes the services of a Dietician and Diabetes Specialist Nurse if required.

All diabetic women should be referred without delay, by their midwife to the Joint Diabetic ANC by ringing the Diabetes Specialist Midwife or contact the booking office on 01872 25 4130, requesting an appointment for the BRODL/5CT. This clinic is held on a Thursday morning at the Diabetes and Endocrine Centre on site.

An early scan will be arranged to confirm viability of pregnancy and gestational age.

2.2. **Time table of Ante Natal Appointments**

The following outlines the care that all women will receive in the Joint Diabetic ANC.

The woman will be given the NICE guidance on Diabetes in Pregnancy, which includes the timetable for ante natal appointments.

In addition to this they will require their normal antenatal care by their community midwife.

Women will be given appointments for the Joint Diabetic antenatal clinic, in between these times at a frequency that will be determined by their diabetic control and their individual needs.

Women with Type 1 DM and women with Type 2 DM on multiple daily injections will be asked to test their blood sugars, fasting, pre-meals and 1 or 2 hours after meals and before bed. Women with Type 2 DM on diet/exercise, oral therapy or single dose intermediate or long acting insulin should test fasting and 1 hour after meals. The following targets will be used:

- Fasting and pre- meals 4.0- **5.3** mmol
- Post prandial target – 1 hour of 4.0- **7.8** mmol or 2 hour of 4.0 – **6.4** mmol

Women with Type 1 DM are offered blood ketone testing strips and advised to test for Ketonaemia and to seek urgent medical advice if they become hyperglycaemic or unwell. They will all be advised of the risks of hypoglycaemia and the potential for unawareness of this in pregnancy. All Diabetic women with Type 1 DM are given glucagon and instructed on how to use it.

If the woman is planning to breastfeed antenatal expressing will be recommended from 36 weeks’ gestation (New 2016)
<table>
<thead>
<tr>
<th>Appointment</th>
<th>Care for Women with Diabetes during Pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>First appointment (ideally by 10 weeks)</td>
<td>Information, advice and support given in relation to optimising glycaemic control. Information and advice given about how diabetes will affect the pregnancy, birth and early parenting. The extent of diabetes-related complications including renal function* will be established and medications will be reviewed and changed if needed. Retinal screening will be arranged (if has not recently been done)** Women will be advised about the schedule of ultrasound scans. The next scan should be booked at each scan appointment.</td>
</tr>
<tr>
<td>Approx 16 wks</td>
<td>Retinal assessment **</td>
</tr>
<tr>
<td>20 weeks</td>
<td>Detailed scan which includes four-chamber view of the fetal heart and outflow tracts</td>
</tr>
<tr>
<td>28 weeks</td>
<td>Ultrasound scan to monitor fetal growth and amniotic fluid volume. Retinal assessment**</td>
</tr>
<tr>
<td>32 weeks</td>
<td>Ultrasound scan to monitor fetal growth and LV</td>
</tr>
</tbody>
</table>
| 36 weeks | Ultrasound scan to monitor fetal growth and LV Information and advice given about:  
- Timing, mode and management of birth. Induction of labour information sheets given to women to take away and read.  
- changes to blood glucose lowering therapy during and after birth  
- care of the baby after birth  
- initiation of breastfeeding and the effect of breastfeeding on glycaemic control  
- Contraception and follow-up. |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>37+0 weeks to 38+6 weeks</td>
<td>Offer induction of labour, or caesarean section if indicated to women with Type 1 &amp; 2 DM. If patient chooses to await spontaneous labour then advised to monitor FM’s on a daily basis and to report any decrease.</td>
</tr>
<tr>
<td>39 weeks</td>
<td>Advise induction of labour or caesarean section if indicated. If declined, encourage to monitor FM’s</td>
</tr>
<tr>
<td>40 weeks</td>
<td>Strongly advise induction of labour or caesarean section if indicated. If declined, encourage to monitor FM’s</td>
</tr>
<tr>
<td>41 weeks</td>
<td>Strongly advise induction of labour or caesarean section if indicated. Reinforce risks of stillbirth related to both diabetes and post maturity. If declined, encourage to monitor FM’s</td>
</tr>
</tbody>
</table>

*If serum creatinine is abnormal or if total protein excretion exceeds 2g/day, referral to a nephrologist should be considered. Thromboprophylaxis should be considered for women with proteinuria above 5g/day  
**If significant retinopathy found then monthly retinal assessments will be organised +/- referral to ophthalmology
2.3 Women with Type 1 or 2 DM or Gestational Diabetes (GDM) at Risk of Pre-term Delivery requiring steroids (New 2017).

TYPE 1 DM
- Women with diabetes who are at risk of pre-term delivery should receive Betamethasone/Dexamethasone (see Pre-term Labour guideline). If steroids are required, women with Type 1DM should be considered for admission to Wheal Rose. VR III (variable rate intravenous insulin infusion/sliding scale) may be required to avoid rapid deterioration in CBG levels.
- With a planned admission an individual plan will be made by the endocrinologist or diabetes team. Should this not be possible then all doses of insulin should be increased by 20%. Increase metformin, if used, to a dose of 2g/day in divided doses.
- Most women are able to administer extra doses of rapid acting insulin according to CBG levels therefore liaise with the woman when deciding appropriate action to an elevated CBG reading.
- Monitor capillary blood glucose (CBG) levels every hour if ≥9 mmol but ≤12 mmol then measure again after 1 hour. If still ≥ 9mmol/l but ≤12mmol/l check blood ketone levels (see appendix 6) if blood ketone levels ≥0.6 but <1.5mmol/l consider commencing VR III or a bolus of rapid acting insulin (after discussion with the woman) (New 2018).
- If >12 mmol at any point and/or ≥1.5 mmol/l commence VR III (Follow appendix 6) as there is an increased risk of diabetic ketoacidosis (new 2017)

TYPE 2 DM AND GDM
- Women with Type 2 DM and GDM regardless of treatment can be managed as an outpatient, unless there are concerns from the diabetes team regarding pre steroid diabetes control. If managed by diet & exercise and/or Metformin, women should be advised to check CBG levels before and 1 hour after each meal and before bed. If managed with insulin then CBG levels should be checked every 2 hours.
- If two consecutive readings are ≥9mmol/l ,1 hour apart regardless of treatment they must be advised to contact Maternity DAU 09.00-17.00 (ext 2916)/Antenatal Triage 17.00-09.00(ext 2788) and will need to be admitted for management of BG levels (new 2017)
- All women should continue increased monitoring for a minimum 12 hours after the last dose of steroids (New 2016).

2.4 Cautionary Notes
- All diabetic women however treated should expect a rise in CBG levels. The rise may be apparent immediately or take several hours depending on the individual response. Rarely, no or minimal effect is seen.
- Women with Type 1 DM are particularly at risk of developing Diabetic Ketoacidosis(DKA)
- Any type of diabetes, however treated where there is evidence of hyperglycaemia (as documented above) should be admitted for assessment
- Where possible seek advice from the diabetes team with the aim of avoiding VR III
- If it is possible to contact a member of the diabetes team and there is any doubt regarding blood glucose levels then VR III should be considered (New 2016).

2.5 Inpatient Management of insulin treated diabetic women
- Ensure Registered nurse assessment form for patient self administration of
subcutaneous insulin CHA 2976 (ideally completed by Diabetes Midwives) is filed in notes.
- Individual sharps container should be given
- All insulin should be prescribed on EPMA & marked for self administration ensuring standard hypoglycaemia and hyperglycaemia management is added.
- Women can monitor their own capillary CBG levels and document on Diabetes Monitoring Chart(CHA1799)

UNLESS :-
- Unwell, any episode of hypoglycaemia or hyperglycaemia (<4 or >9 mmol/l) (New 2018) then confirm reading on ward based meter and take appropriate action OR
- Are being managed with VRIII (New 2016).

2.6 Diabetic Ketoacidosis(DKA)
- Ketoacidosis should be excluded as a matter of urgency (see appendix 6) (New 2017)
- Women who are suspected or confirmed as having diabetic ketoacidosis should be admitted immediately to High Dependency Unit (HDU)
- Inform the endocrinologist and the Obstetric Consultant/ Obstetric Registrar on call of admission without delay. In this situation, it is appropriate to attempt to contact the Endocrinologist out of hours.
- Senior Obstetrician to review the patient in person and arrange assessment of fetal wellbeing. The main risk is preterm labour and Intra Uterine Death (IUD). Discuss the obstetric management with the designated Obstetrician or on call Consultant Obstetrician. If steroids are appropriate then discuss the implications of this with the Endocrinologist.

2.7. Caesarean Section (CS) and Steroids
- Elective CS performed after 38 weeks is not an indication for steroids in diabetic women, as the impairment in glycaemic control associated with steroid use is likely to offset any benefits obtained.
- See also RCHT: Management of Diabetic Women for Elective Caesarean Section (New 2018). (Appendix 3)

2.8. Care in Labour
- See RCHT: Management of a Woman with Diabetes in Established Labour. (Appendix 4)

2.9. Post Natal Care
- See RCHT: Management of a Woman with Diabetes Post Delivery. (Appendix 5)

- Whilst establishing breastfeeding, it is important to avoid hypoglycaemic episodes
- Post-delivery, women should be prescribed their pre pregnancy insulin doses
• Breastfeeding may require a reduction in insulin dose by 25%
• Carbohydrate requirements of the mother may increase
• The mother should be encouraged to have a carbohydrate snack or meal before or during each episode of breastfeeding and before bed time
• If hypoglycaemia occurs treat the hypo (as per management of RCHT hypoglycaemia guideline), reduce the dose of insulin and ensure snacks are being taken
• If breastfeeding is suddenly stopped, the dose of insulin will need to be increased

2.11. Documentation
At first contact with the Diabetes Specialist Midwife the RCHT Joint Diabetes Antenatal Clinic Record of Pregnancy care booklet will be commenced. This will contain the individual management plan for pregnancy, labour and the post natal period.
Gestational Diabetes (GDM)

2.12 Women with the following risk factors should be offered an oral glucose tolerance test (OGTT) to test for gestational diabetes at 26 weeks.¹ (See below regarding missed GTT’s)

- BMI above 30 kgs/m²
- Previous macrosomic baby weighing 4.5 kgs or above
- First degree relative (parents/siblings) with diabetes - Type 1 and 2
- Family origin with a high prevalence of diabetes e.g. South Asian, Black Caribbean and Middle-Eastern
- Confirmed polycystic ovarian syndrome (PCOS) especially if treated with Metformin
- Previous unexplained stillbirth
- GTT should also be performed for:
  - Confirmed polyhydramnios or fetal macrosomia (at any gestational age)
  - Glycosuria of 2+ or above on 1 occasion or of 1+ or above on 2 or more occasions. (New 2016).
- Following a normal OGTT performed for glycosuria under 34 weeks; do not repeat if glycosuria persists UNLESS the level of glycosuria increases or there are additional obstetric concerns suggestive of elevations in blood glucose levels (e.g. acceleration in fetal growth or polyhydramnios confirmed by ultrasound scan. (New 2018)
- After 34 weeks gestation new glycosuria is less likely to be due to elevations in blood glucose a borderline OGTT may be difficult to interpret as the normal glucose range is not known for this gestation. However, if there are additional concerns suggestive of elevations in blood glucose levels (e.g. acceleration in fetal growth or polyhydramnios confirmed by ultrasound scan, then perform a random capillary glucose, if ≥7.8mmol/l take blood for an HbA1c and refer to Diabetes Specialist Midwives to commence CBG monitoring, if <7.8mmol/l arrange an urgent OGTT and follow up the result. (New 2018)
- If GTT is missed or initially declined do not offer OGTT after 34 weeks UNLESS there are additional obstetric concerns suggestive of elevations in glucose (e.g. acceleration in growth or polyhydramnios confirmed by scan). (New 2018)
- Women who have had gastric bypass surgery (excluding gastric band) should not have a GTT. Instead advise testing capillary blood glucose levels for one week at 26 weeks refer to Diabetes Specialist Midwives to arrange. (New 2016)

2.13 So that women can make an informed decision about risk assessment and testing for gestational diabetes, explain that:

- In some women, gestational diabetes will respond to changes in diet and exercise
- The majority of women will need oral blood glucose-lowering agents or insulin therapy if changes in diet and exercise do not control gestational diabetes effectively.
• If gestational diabetes is not detected and controlled, there is a small increased risk of serious adverse birth complications such as shoulder dystocia
• A diagnosis of gestational diabetes will lead to increased monitoring, and may lead to increased interventions, which may include insulin administration during both pregnancy and labour.
• A record of this discussion and her decision accordingly, needs to be documented in the woman’s notes and written information given to her.

2.14. Glucose Tolerance Test: (OGTT)

The ‘gold standard’ diagnostic test for GDM is the 75g oral glucose tolerance test (OGTT) conducted at 24-28 weeks of gestation. (Aim for 26 weeks)

2.15. Procedure for the OGTT Test

• The test should be performed in the morning following an overnight fast, (min 8 hours). The woman should refrain from smoking.
• A blood sample is taken for measurement of fasting glucose before the test is undertaken
• A glucose load equivalent to 75grams of anhydrous glucose (Polycal 113mls) mixed with water to give a total fluid volume of 250-300mls.
• The glucose should be consumed over a 5 minute period (timing of the test starts at the beginning of ingestion). There should be no smoking or exercise throughout the duration of the test
• A further blood sample is collected 2 hours after the glucose load for a further measurement of the glucose concentration.

2.16. Interpretation of Results

<table>
<thead>
<tr>
<th></th>
<th>Fasting glucose</th>
<th>120 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;5.6 mmol/l</td>
<td>&lt; 7.8 mmol/l</td>
</tr>
<tr>
<td>Gestational Diabetes</td>
<td>≥5.6 mmol/l</td>
<td>≥7.8 mmol/l</td>
</tr>
</tbody>
</table>

The community midwife ordering the test is responsible for checking the results and making the referral.
2.17. **Women with a previous history of gestational diabetes**
All women with previous GDM should be offered a OGTT as soon as possible after booking and a further OGTT at 26 weeks. *(New 2016)*

2.18. **Subsequent management of women with Gestational Diabetes Mellitus**
- Any women whose OGTT has fallen within the range for gestational diabetes should be notified to the Diabetes Specialist Midwives.
- An appointment to commence self-monitoring of capillary blood glucose (CBG) levels will be arranged and advice to maintain capillary CBG within normal range ie fasting of 4.0 - 5.3 mmol, 1 hour post meal of 4.0 - 7.8 mmol will be given.
- A blood test to determine glycosylated haemoglobin (HbA1c – purple tube sent to clinical chemistry) will be checked in all women with GDM at diagnosis to identify those who may already have Type 2 DM.
- Offer women with a diagnosis of GDM a review with the joint diabetes and antenatal clinic within 1 week.
- Fetal growth and liquor volume scans will be arranged four weekly from diagnosis, but not before 26 weeks gestation (if not already following an SGA scan pathway). *(New 2018)*
- Inform the primary healthcare team when a woman is diagnosed with GDM (a letter will be sent to the GP, informing of diagnosis).

2.19 **Particular information that will be given to the woman is as follows:-**
- The role of diet, body weight and exercise (such as walking for 30 minutes after a meal). In particular emphasise that foods with a low glycaemic index should replace those with a high glycaemic index
- Advise that as well as changes in diet and exercise, tablets and or insulin may be required.
- If blood glucose targets are not met using changes in diet and exercise within 1–2 weeks metformin will be offered.
- If metformin is contraindicated or unacceptable to the woman, insulin instead of metformin will be offered.
- If blood glucose targets are not met insulin will be offered in addition to the treatments of changes in diet, exercise and metformin.
- If the fasting plasma glucose level is 7.0 mmol/litre or above at diagnosis, along with changes in diet and exercise, immediate treatment with insulin, with or without metformin may be offered.
- Consider immediate treatment with insulin, with or without metformin, as well as changes in diet and exercise, for women with GDM who have a fasting plasma glucose level of between 6.0 and 6.9 mmol/litre if there are complications such as macrosomia or polyhydramnios.
- Advise pregnant women with GDM who are on a multiple daily insulin injection regimen to test their fasting, pre-meal, 1-hour post meal and bedtime blood glucose levels daily.
- Advise pregnant women with GDM to test their fasting and 1-hour post-meal blood glucose levels daily during pregnancy if they are: on diet and exercise therapy or taking oral therapy or single dose intermediate-acting or long-acting insulin.
• Consider glibenclamide for women with GDM: in whom blood glucose targets are not achieved with metformin but who decline insulin therapy or who cannot tolerate metformin.

2.20 Women will be informed that good blood glucose control throughout pregnancy will reduce the risk of:

- Fetal macrosomia, trauma during birth (for her and her baby), induction of labour and/or caesarean section, neonatal hypoglycaemia and perinatal death
- The risk of the baby developing obesity and/or diabetes in later life

2.21 Additional advice offered:

- Increased risk of developing Type 2 DM in the future
- To give birth in hospitals where advanced neonatal resuscitation skills are available 24 hours a day.
- Not to be discharged home until the baby is at least 24 hours old, ensuring that the baby is maintaining blood glucose levels and is feeding well.

2.22 Recommendations for Delivery

- Women with GDM with no complications and good control will be advised to give birth no later than 40+6 weeks, and if not given birth by this time induction of labour or CS will be offered
- If there are fetal or maternal complications, delivery before this will be offered
- Mode and timing of delivery will be discussed in the Joint diabetes ANC at 36 weeks and a discussion form will be completed.
- Antenatal hand expressing will be recommended from 36/40

All other antenatal care for that woman should be as normal, performed by the community midwife.

2.23 Intra-partum management women with GDM

Please refer to the flow chart ‘Management of women with Diabetes in Established Labour’ (Appendix 4)

2.24 Post-natal Management

- All women with GDM should discontinue blood glucose monitoring and glucose lowering treatment post-delivery (unless they have been otherwise advised).
- Prior to discharge to community care: - All women with GDM should have a capillary blood glucose check using ward-based meter pre-meal and should be performed at least four hours post-delivery.
  - If < 7mmol/l no further testing required until 6/52 follow up – see below
  - If 7-10mmol/l may be discharged but to continue capillary blood glucose testing at home. Inform Diabetes Specialist Midwife (ext. 3199) who will follow up.
  - If >10mmol/l prior to discharge the woman will need to be reviewed by the diabetic team (out of hours this will need to be the on call medical registrar) as may require
long term diabetic treatment and 6/52 follow up in the Diabetes Antenatal Clinic (New 2016)

2.25 Remind women of the symptoms of hyperglycaemia (thirst and polyuria) prior to discharge and to report any symptoms to a health care provider.

- Explain to women who were diagnosed with gestational diabetes about the risks of gestational diabetes in future pregnancies, and offer them testing for diabetes.
- For women who were diagnosed with gestational diabetes and whose blood glucose levels returned to normal after the birth: Offer lifestyle advice (including weight control, diet and exercise).
- Offer a fasting plasma glucose test 6–13 weeks after the birth to exclude diabetes (for practical reasons this might take place at the 6-week postnatal check). GP letter will be sent by the Diabetes Specialist Midwife to request (copied to the woman).
- If a fasting plasma glucose test has not been performed by 13 weeks, an HbA1c is recommended.
- Women should have an annual HbA1c by the GP (New 2016)
### 3. Monitoring compliance and effectiveness

<table>
<thead>
<tr>
<th>Element to be monitored</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>The audit will take into account record keeping by obstetric, anaesthetic and paediatric doctors, midwives, nurse, students and maternity support workers. The results will be inputted onto an excel spread sheet. The audit will be registered with the Trust’s audit department.</td>
<td></td>
</tr>
<tr>
<td><strong>Lead</strong></td>
<td>Diabetes Specialist Midwife</td>
</tr>
<tr>
<td><strong>Tool</strong></td>
<td>Did the woman have initial contact with the diabetes specialist midwife. Was the woman seen in the Joint Obstetric/Endocrinologist Diabetic ANC? If required was a referral made to a Dietician and/or a Diabetes Specialist Nurse? Was it documented that the woman received a copy of the NICE guidance on diabetes in pregnancy, which includes the timetable for antenatal appointments. Did the woman receive an ultrasound examination of the four chamber view of the fetal heart and outflow tracts at 20 weeks?</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>10 sets of all health records of women who have delivered with a diagnosis of pre existing diabetes will be audited over the lifetime of the guideline.</td>
</tr>
<tr>
<td><strong>Reporting arrangements</strong></td>
<td>A formal report of the results will be received annually at the maternity Patient Safety Meeting and clinical audit forum, as per the audit plan. During the process of the audit if compliance is below 75% or other deficiencies identified, this will be highlighted at the next maternity Patient Safety Meeting and clinical audit forum and an action plan agreed.</td>
</tr>
<tr>
<td><strong>Acting on recommendations and Lead(s)</strong></td>
<td>Any deficiencies identified on the annual report will be discussed at the maternity Patient Safety Meeting and clinical audit forum and an action plan developed. Action leads will be identified and a time frame for the action to be completed by. The action plan will be monitored by the maternity Patient Safety Meeting and clinical audit forum until all actions complete.</td>
</tr>
<tr>
<td><strong>Change in practice and lessons to be shared</strong></td>
<td>Required changes to practice will be identified and actioned within a time frame agreed on the action plan. A lead member of the forum will be identified to take each change forward where appropriate. The results of the audits will be distributed to all staff through the Patient Safety newsletter/audit forum as per the action plan.</td>
</tr>
</tbody>
</table>

### 4. Equality and Diversity
4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the 'Equality, Diversity & Human Rights Policy' or the Equality and Diversity website.

4.2. **Equality Impact Assessment**

The Initial Equality Impact Assessment Screening Form is at Appendix 2.
## Appendix 1. Governance Information

<table>
<thead>
<tr>
<th>Document Title</th>
<th>MANAGEMENT OF DIABETES MELLITUS (DM) IN PREGNANCY, TYPE 1, TYPE 2 AND GESTATIONAL DIABETES (GDM) – CLINICAL GUIDELINE V1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Issued/Approved:</td>
<td>14&lt;sup&gt;th&lt;/sup&gt; February 2018</td>
</tr>
<tr>
<td>Date Valid From:</td>
<td>14&lt;sup&gt;th&lt;/sup&gt; February 2018</td>
</tr>
<tr>
<td>Date Valid To:</td>
<td>14&lt;sup&gt;th&lt;/sup&gt; February 2021</td>
</tr>
</tbody>
</table>
| Directorate / Department responsible (author/owner): | Helen Probert  
Diabetes Specialist Midwife  
Obs and Gynae Directorate |
| Contact details: | 01872 253199 |
| Brief summary of contents | To provide guidance to Midwives, Obstetricians and the Joint Obstetric/Diabetology Team on the management of a pregnant woman with Type 1 or Type 2 Diabetes. |
| Suggested Keywords: | Diabetes, pregnancy, Type 1 & Type 2, Metformin, breast, feeding |
| Target Audience | RCHT | PCH | CFT | KCCG |
| Executive Director responsible for Policy: | Medical Director |
| Date revised: | 08/02/2018 |
| This document replaces (exact title of previous version): | Clinical guideline for the management of type 1 & type 2 diabetes in pregnancy V1.4 merged with Gestational Diabetes Mellitus and subsequent management of confirmed gestational diabetes mellitus(GDM) and selective screening-clinical guideline V1.6 |
| Approval route (names of committees)/consultation: | Maternity Guidelines Group  
Obs and Gynae Directorate  
Divisional Board for Noting |
<p>| Divisional Manager confirming approval processes | Head of Midwifery |
| Name and Post Title of additional signatories | Not Required |
| Name and Signature of Divisional/Directorate Governance | {Original Copy Signed} |</p>
<table>
<thead>
<tr>
<th><strong>Lead confirming approval by specialty and divisional management meetings</strong></th>
<th>Name: Caroline Amukusana</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Signature of Executive Director giving approval</strong></td>
<td>[Original Copy Signed]</td>
</tr>
<tr>
<td><strong>Publication Location (refer to Policy on Policies – Approvals and Ratification):</strong></td>
<td>Internet &amp; Intranet</td>
</tr>
<tr>
<td><strong>Document Library Folder/Sub Folder</strong></td>
<td>Clinical/Midwifery and Obstetrics</td>
</tr>
<tr>
<td><strong>Links to key external standards</strong></td>
<td>N/A</td>
</tr>
</tbody>
</table>
| **Related Documents:** | - RCHT (2016) Management of a Woman with Diabetes in Established Labour  
- RCHT (2016) Management of a Woman with Diabetes in the post natal period  
- RCHT(2018) Management of Diabetic Women for Elective Caesarean Section  
- NICE (2015) Diabetes in pregnancy: management from preconception to the post natal period  
- JBDS-IP (May 2017) Management of glycaemic control in pregnant women with diabetes on obstetric wards and delivery units. |
<p>| <strong>Training Need Identified?</strong> | No |</p>
<table>
<thead>
<tr>
<th>Date</th>
<th>Version No</th>
<th>Summary of Changes</th>
<th>Changes Made by (Name and Job Title)</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 2008</td>
<td>V1.0</td>
<td>Initial guideline</td>
<td>Karen Watkins Consultant Obstetrician</td>
</tr>
<tr>
<td>October 2010</td>
<td>V1.1</td>
<td>Reviewed and no changes made</td>
<td>Karen Watkins Consultant Obstetrician</td>
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<tr>
<td>July 2012</td>
<td>V1.2</td>
<td>Reviewed and compliance monitoring added</td>
<td>Helen Probert Diabetes Specialist</td>
</tr>
<tr>
<td>March 2016</td>
<td>V1.3</td>
<td>Added: Section 2.8 on Breastfeeding Updated: blood sugar levels. Fasting and pre-meals 4.0-5.3 mmol Post prandial target – 1 hour of 4.0-7.8 mmol or 2 hour of 4.0-6.4 mmol. Updated: Antenatal expressing is recommended from 36 weeks gestation for mothers who wish to breast feed. Ketone strips.</td>
<td>Helen Probert Diabetes Specialist Midwife</td>
</tr>
<tr>
<td>17/11/2017</td>
<td>V1.4</td>
<td>Appendix reference added to 2.6</td>
<td>Helen Probert Diabetes Specialist</td>
</tr>
<tr>
<td>08/02/2018</td>
<td>V1.0</td>
<td>Amalgamation of Clinical guideline for the management of Type 1 &amp; Type 2 diabetes in pregnancy V1.3 and Gestational Diabetes Mellitus and subsequent management of confirmed gestational diabetes mellitus (GDM) and selective screening-clinical guideline V1.5</td>
<td>Helen Probert Diabetes Specialist Midwife</td>
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<tr>
<td>08/02/2018</td>
<td>V1.0</td>
<td>Management of diabetes following steroid administration</td>
<td>Helen Probert Diabetes Specialist Midwife</td>
</tr>
<tr>
<td>08/02/2018</td>
<td>V1.0</td>
<td>Management of glycosuria after 34 weeks gestation.</td>
<td>Helen Probert Diabetes Specialist Midwife</td>
</tr>
</tbody>
</table>

All or part of this document can be released under the Freedom of Information Act 2000

This document is to be retained for 10 years from the date of expiry.

This document is only valid on the day of printing

Controlled Document
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Appendix 2. Initial Equality Impact Assessment Form

This assessment will need to be completed in stages to allow for adequate consultation with the relevant groups.

<table>
<thead>
<tr>
<th>Name of the strategy / policy / proposal / service function to be assessed</th>
</tr>
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<tbody>
<tr>
<td>MANAGEMENT OF DIABETES MELLITUS (DM) IN PREGNANCY, TYPE 1, TYPE 2 DIABETES MELLITUS (DM) &amp; GESTATIONAL DIABETES (GDM), CLINICAL GUIDELINE V1.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Directorate and service area:</th>
<th>Is this a new or existing Policy?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obs and Gynae Directorate</td>
<td>New guideline that merges previous diabetes guidelines</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name of individual completing assessment:</th>
<th>Telephone:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helen Probert</td>
<td>01872 25 3199</td>
</tr>
</tbody>
</table>

1. **Policy Aim**

*Who is the strategy / policy / proposal / service function aimed at?*

To provide guidance to Midwives, Obstetricians and the Joint Obstetric/Diabetology Team on the management of a pregnant woman with Type 1 or Type 2 Diabetes or Gestational Diabetes.

2. **Policy Objectives**

To ensure pregnant woman with diabetes receive current evidence based care

3. **Policy – intended Outcomes**

Good pregnancy outcome for woman with diabetes in pregnancy

4. **How will you measure the outcome?**

Compliance monitoring tool

5. **Who is intended to benefit from the policy?**

Pregnant woman with pre-existing diabetes

6a **Who did you consult with?**

Workforce | Patients | Local groups | External organisations | Other
---|---|---|---|---
| | | | | x

b. Please identify the groups who have been consulted about this procedure.

Clinical Guideline Group
Obstetric and Gynaecology Directorate
What was the outcome of the consultation? | Guideline agreed

### 7. The Impact
Please complete the following table. **If you are unsure/don’t know if there is a negative impact you need to repeat the consultation step.**

<table>
<thead>
<tr>
<th>Equality Strands:</th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
<th>Rationale for Assessment / Existing Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td>X</td>
<td></td>
<td>All pregnant woman with diabetes</td>
</tr>
<tr>
<td><strong>Sex</strong> (male, female, trans-gender / gender reassignment)</td>
<td>X</td>
<td></td>
<td></td>
<td>All pregnant woman with diabetes</td>
</tr>
<tr>
<td><strong>Race / Ethnic communities /groups</strong></td>
<td>X</td>
<td></td>
<td></td>
<td>All pregnant woman with diabetes</td>
</tr>
<tr>
<td><strong>Disability - Learning disability, physical impairment, sensory impairment, mental health conditions and some long term health conditions.</strong></td>
<td>X</td>
<td></td>
<td></td>
<td>All pregnant woman with diabetes</td>
</tr>
<tr>
<td><strong>Religion / other beliefs</strong></td>
<td>X</td>
<td></td>
<td></td>
<td>All pregnant woman with diabetes</td>
</tr>
<tr>
<td><strong>Marriage and Civil partnership</strong></td>
<td>X</td>
<td></td>
<td></td>
<td>All pregnant woman with diabetes</td>
</tr>
<tr>
<td><strong>Pregnancy and maternity</strong></td>
<td>X</td>
<td></td>
<td></td>
<td>All pregnant woman with diabetes</td>
</tr>
<tr>
<td><strong>Sexual Orientation, Bisexual, Gay, heterosexual, Lesbian</strong></td>
<td>X</td>
<td></td>
<td></td>
<td>All pregnant woman with diabetes</td>
</tr>
</tbody>
</table>

You will need to continue to a full Equality Impact Assessment if the following have been highlighted:
- You have ticked “Yes” in any column above and
- No consultation or evidence of there being consultation- this **excludes** any policies which have been identified as not requiring consultation. or
- Major this relates to service redesign or development
8. Please indicate if a full equality analysis is recommended.  

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

9. If you are **not** recommending a Full Impact assessment please explain why.

N/A

<table>
<thead>
<tr>
<th>Signature of policy developer / lead manager / director</th>
<th>Date of completion and submission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helen Probert</td>
<td>08/02/2018</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Names and signatures of members carrying out the Screening Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Helen Probert</td>
</tr>
<tr>
<td>2. Human Rights, Equality &amp; Inclusion Lead</td>
</tr>
</tbody>
</table>

**Keep one copy and send a copy to the Human Rights, Equality and Inclusion Lead**
c/o Royal Cornwall Hospitals NHS Trust, Human Resources Department, Knowledge Spa, Truro, Cornwall, TR1 3HD

**This EIA will not be uploaded to the Trust website without the signature of the Human Rights, Equality & Inclusion Lead.**

A summary of the results will be published on the Trust’s web site.

Signed Sarah-Jane Pedler  
Date 08/02/2018
**Appendix 3) Management of Women with Diabetes for Elective Caesarean Section**

**Type 1 DM, Type 2 DM & Insulin treated Gestational Diabetes**

- Background Insulin (if applicable) to be given at normal time, i.e. evening before and or morning of CS. Omit morning rapid acting insulin. Women with CSII should be able to maintain their pump throughout CS.

**Gestational Diabetes Diet +/- Metformin**

- Follow normal CS admission pathway Except Do not give pre op drinks.

**Check CBG on admission. Only treat if < 3.5 mmol/l OR If > 8mmol/l follow insulin treated algorithm.**

**NBM from 04.00hrs**
- Admit 09:00 to Delivery Suite
- Ensure booked 1st on the list
- DO NOT GIVE PRE OP DRINKS.
- The woman should contact delivery suite for admission if she experiences any episode of hypoglycaemia prior to admission

**Check CBG on admission & 1 hourly if CBG**

- **< 4 mmol/l**
  - Follow algorithm for Management of Hypoglycaemia (nil by mouth) in Orange Hypo Box
  - Proceed with CS

- **4 - 8 mmol/l**
  - Consider stat dose of rapid acting insulin, usually Novorapid or Humalog (e.g. 2 - 4 units) **BUT** aim to individualise by consulting the woman. Dose will depend on individual total dose of insulin and insulin sensitivity. Repeat CBG, pre CS or in 1 hour. If 4 - 8 mmol/l proceed with CS.

- **> 8 - 12 mmol/l**
  - Proceed with CS

- **> 12 mmol/l**
  - Woman unwell, vomiting or at anaesthetist request

- **Commence VR III**
  - > 8 mmol/l
Appendix 4)
Management of Women with Diabetes in Established Labour

Type 1 DM

- Continue background insulin throughout established labour at normal times. No rapid acting insulin to be given subcutaneously. Women with CSII to maintain own infusion. If unable to manage own pump then a VRIII will be required.

Type 2 DM & Insulin treated GDM

- No subcutaneous insulin to be given during labour
- Monitor CBG hourly
- < 4 mmol/l
  - Follow algorithm for Management of Hypoglycaemia in orange hypo box

Gestational Diabetes Diet controlled or Metformin treated

- Check CBG at onset of labour
- ≤ 7 mmol/l
- ≥ 7 mmol/l
- Repeat CBG in 1 hour
- No further CBG monitoring
- ≥ 7 mmol/l
- Consider commencing VRIII (particularly if delivery is not imminent and woman has Type 1, 2 or insulin treated GDM)

CSII = Continuous Subcutaneous Insulin Infusion (insulin pump) Aim to maintain CBG levels between 4-7mmol/l throughout labour
VRIII = Variable Rate Intravenous Insulin Infusion (sliding scale).
CBG = Capillary blood glucose monitoring
Appendix 5
Management of Diabetic Women Post-Delivery
(Insulin, Metformin and Diet-controlled)

Delivery - Caesarean Section or Vaginal

Type 1 DM
- Monitor CBG hourly until able to tolerate diet
  - Give rapid acting insulin with next meal (pre pregnancy dose)
    - See below
  - If food is tolerated, discontinue VRIII (If used)
  - The woman should continue to monitor CBG levels as instructed antenatally

Type 2 DM
- See individual plan of care in notes
- Follow-up appointment in joint diabetic/antenatal clinic in 6 weeks

Gestational Diabetes, Insulin treated
- STOP insulin and Blood Glucose monitoring

Gestational Diabetes, Diet controlled OR Metformin treated
- STOP Metformin and Blood Glucose monitoring

Check CBG (on ward based meter) at least 4 hours after delivery and before next meal.

- <7 mmol/l
- ≥7- <10mmol/l
- ≥10mmol/l

Fasting venous blood glucose in 6 weeks via GP. Letter will be sent by Diabetes Specialist Midwife

The woman may be discharged but should continue CBG monitoring. Leave a message for the on call medical registrar as may need ongoing diabetes treatment.

Check urine for ketones. Request Diabetes Team review prior to discharge if not available.
Appendix 6

Guidance for capillary Blood Ketone testing in pregnant women at risk of Diabetic Ketoacidosis (DKA)

**When to measure blood ketone levels:-**
- All women with Type 1 DM who are admitted **UNWELL/VOMITING**. (DKA less likely but not impossible with Type 2 DM, consider testing if 2+ or more urinary ketones).
- Blood ketone monitoring is NOT for the routine use of women with hyperemesis

**Interpretation of Blood Ketones (B-OHB)**

<table>
<thead>
<tr>
<th>$\beta$ OHB mmol/L</th>
<th>Action</th>
</tr>
</thead>
</table>
| Below 0.6mmol/l     | - Normal ketone levels – continue to test blood glucose levels as normal  
                     - Treat for elevated glucose appropriately (discuss with the woman as she is likely to know how to manage this herself or if possible refer to diabetes team) |
| 0.6 – 1.5mmol/l     | - Doctor to review  
                     - Ensure adequate fluid intake (if tolerating oral fluids advise at least 200mls water/sugar free fluids every hour)  
                     - Consider giving additional rapid acting insulin  
                     - Retest blood glucose and ketones in 1 hour (blood ketones can rise by 1-2mmol/L per hour.) |
| Over 1.5mmol/l      | Risk of DKA  
                     - Contact a doctor immediately  
                     - Assess woman for signs of DKA urgently, check U & E’s, bicarbonate and pH on venous blood gas analyser  
                     - If confirmed DKA (Bicarbonate $<$ 15.0mmol/L and or pH $<$ 7.3) follow Clinical guideline for the management of Diabetic Ketoacidosis (DKA) in adult. Admit for level 2 critical care  
                     - If the pH and bicarbonate are normal the woman is likely to still require additional insulin and fluid replacement via VRIII (or additional subcutaneous doses on advice of diabetes team if possible)  
                     - Recheck blood glucose and ketone levels hourly (blood ketones level should fall by 0.5mmol/L per hour) |

*In pregnancy DKA can occur with a normal blood glucose level  
VRIII variable rate intravenous insulin infusion (sliding scale)*