

## Diabetes in Pregnancy – Gestational (Including Glucose Tolerance Testing)

This guidance does not override the individual responsibility of health professionals to make appropriate decision according to the circumstances of the individual patient in consultation with the patient and /or carer. Health care professionals must be prepared to justify any deviation from this guidance.

### Introduction

Guideline for the management of Gestational Diabetes.

### This guideline is for use by the following staff groups:

All Maternity staff

#### Lead Clinician(s)

Catherine Hillman Cooper	Consultant Obstetrician – Maternal Medicine
Reham Marie	Locum Consultant Obstetrics
Kealy Ballard	Diabetes Specialist Midwife
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Approved by <i>Maternity Governance Meeting</i> on:	27 <sup>th</sup> February 2026
Approved by Medicines Safety Committee on: <i>Where medicines included in guideline</i>	2020 (Prescription CRVII charts)
Review Date:	27 <sup>th</sup> February 2029
This is the most current document and should be used until a revised version is in place	

#### Key amendments to this guideline

Date	Amendment	Approved by:
June 2023	Full Guideline Review – New Nice Guidance	MGM
Sept 2024	Revision to OGTT Timings	MGM
June 2025	Revision to OGTT >36 weeks and 3 day monitoring	MGM
Feb 2026	GTT Process updated	MGM

#### **Inclusion statement**

We recognise that although our policy uses words such as women/woman, not all birthing people or post-natal parents will identify as such. We encourage all staff to be welcoming of the diversity of our local population, be respectful of preferred language, pronouns, and adapt their communication appropriately. All staff should accommodate mothers and parents with individual needs or disabilities, whether they be physical or not visible, and adapt their care to support them with their pregnancy.

## **Background**

A diagnosis of gestational diabetes (GDM) is associated with an increased risk chance of fetal macrosomia, polyhydramnios, pre-eclampsia, caesarean section, induction of labour, instrumental birth, transient neonatal hypoglycaemia and increased risk of obesity and diabetes later in the baby's life (NICE, 2015). Up to 50% of those that have been diagnosed with GDM may go on to develop Type 2 diabetes within 5 years postpartum (RCOG 2021). Good glycaemic control throughout pregnancy, losing excess weight and continuing healthy diet and lifestyle after birth reduces this chance, but will not eliminate them.

## **Aim**

This clinical guideline aims to provide evidence-based recommendations for the screening and management of Gestational Diabetes Mellitus (GDM)

These recommendations include guidance on:

- Screening criteria for GDM
- Interpretation of oral glucose tolerance test (OGTT) results
- Management of gestational diabetes – referral process to appropriate clinic
- Target ranges for glycaemic control and treatment thresholds
- The timetable of antenatal appointments to be offered to people with GDM
- The timing and mode of birth
- Intrapartum and postpartum care of people with gestational diabetes
- Neonatal care of babies born to people with gestational diabetes
- Counselling using BRAINS tool

## **Guideline Scope**

This guideline applies to all those who develop gestational diabetes and who are booked and cared for at Worcestershire Acute Hospitals NHS Trust.

## **Definitions**

- Gestational Diabetes Mellitus is any degree of carbohydrate intolerance resulting in hyperglycaemia of variable severity with onset or first recognition during pregnancy, which resolves spontaneously following the birth of the baby.
- Multi-disciplinary Team (MDT): Consultant Obstetrician/Consultant Diabetologist, Diabetes Specialist Midwife, Diabetes Specialist Nurse and Dietician.

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### Screening

At booking determine the need for an oral glucose tolerance test (OGTT) to be done between 24 to 26 weeks gestation using the following risk factors

- First degree relative with a history of Type 1 or Type 2 diabetes (parent or sibling of the pregnant woman).
- Previous unexplained stillbirth.
- Obesity: BMI >30kg/m<sup>2</sup>
- Confirmed polycystic ovary disease. (If on metformin for assisting ovulation, it should be stopped at the end of first trimester)
- High risk ethnic group: Chinese, South Asia (India, Pakistan, Bangladesh), Afro-Caribbean or Middle East (Saudi Arabia, United Arab Emirates, Iraq, Jordan, Syria, Oman, Qatar, Kuwait, Lebanon, Egypt). People with dual heritage should not be offered an OGTT unless other risk factors exist.
- Previous baby >4.5Kg or >95<sup>th</sup> Centile
- On medications in pregnancy:
  - Oral steroids (e.g. Prednisolone)
  - Tacrolimus
  - Antipsychotic medication (Olanzapine/ Quetiapine/Clozapine).
  - Protease Inhibitors (HIV medication)

### Other indications for OGTT

- 1-Suspected large-for-gestational age fetus/ suspected by ultrasound measurement showing estimated fetal weight above 90<sup>th</sup> centile on customized chart **AND** Abdominal circumference above 90<sup>th</sup> centile. OGTT to be done once on suspecting LGA and if negative not to be repeated unless new indication arises.
- 2- Glycosuria 1+ on more than one occasion /or Glycosuria of 2+ or more on one occasion. In case of persistent glycosuria OGTT not to be repeated more than twice for the same indication and with at least 4 weeks interval. In cases of persistent glycosuria, early morning urine sample and U&Es should be considered and patient to be referred to consultant care. This is to rule out renal disease.
- 3- Polyhydramnios (single deepest pool > 8cm), OGTT to be done at diagnosis of polyhydramnios and not to be repeated for the same indication.

The 75 gm of glucose is provided by Polycal at all sites. The OGTT can be performed for any of the above indications up until 40+0 weeks gestation.

If there is suspicion of GDM after 40 weeks gestation, a plan should be made by Consultant Obstetrician, in partnership with the birthing person and their family- A joint discussion between the woman/birthing person and the obstetrician will decide whether screening for GDM is appropriate or if earlier birth needs to be considered/offered in line with their individual risks and preferences. Using the BRAINS tool can support this decision making.

Please note that people who have had bariatric surgery (gastric band, gastric sleeve & gastric bypass) must **not** be booked for an OGTT and instead require investigation by 3 days of Capillary Blood Glucose (CBG) profiling. This is due to altered gastro-intestinal transit time and thereby higher risk of dumping

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syndrome- which is when food (especially food that is high in sugar) is emptied too quickly from the stomach to the small intestine. This can cause a range of symptoms including nausea, vomiting, sweating, dizziness, hypoglycaemia and confusion.

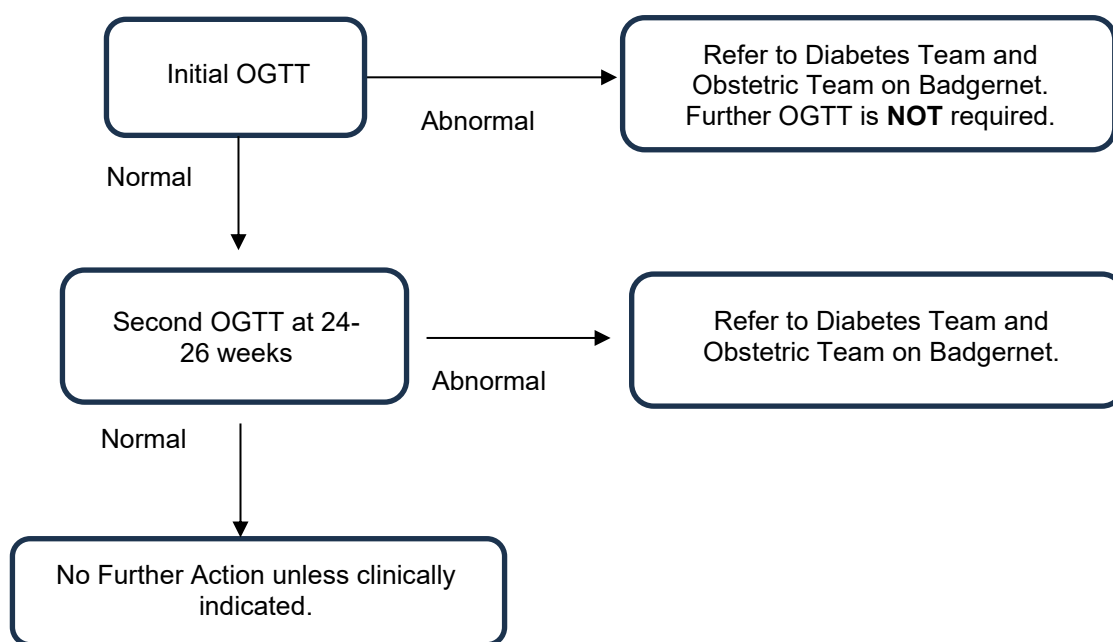
- Women should be seen by the Day Assessment Unit at the respective site to establish CBG monitoring
- Women are asked to monitor their CBG levels for 3 days whilst continuing their normal diet
- Women will be advised who to contact with their results
- If  $\geq 3$  values above target range (see CBG monitoring form) assume GDM, make appropriate referrals as below.

**Women with previous gestational diabetes/ history of pre-diabetes**

Maternity Day Assessment Unit (DAU) referral for OGTT should be made to be performed as early as possible in the pregnancy after dating scan (or before, if preferred by birthing woman or clinician). If the result is within normal parameters a repeat OGTT should be performed between 24-26 weeks which should be booked by DAU staff at time of first OGTT.

Abnormal results at initial OGTT: Make referrals to the Diabetes Team and Obstetric team via Badgernet for the appropriate follow up. **A further OGTT is not required.** (Please note- even if the woman has previously had an obstetric referral for another reason, it **MUST** be sent again at diagnosis of GDM as this may change the care pathway)

**Previous GDM or history of pre-diabetes OGTT Process**



**All people requiring OGTT should have a fasting capillary blood glucose tested, prior to performing OGTT.**

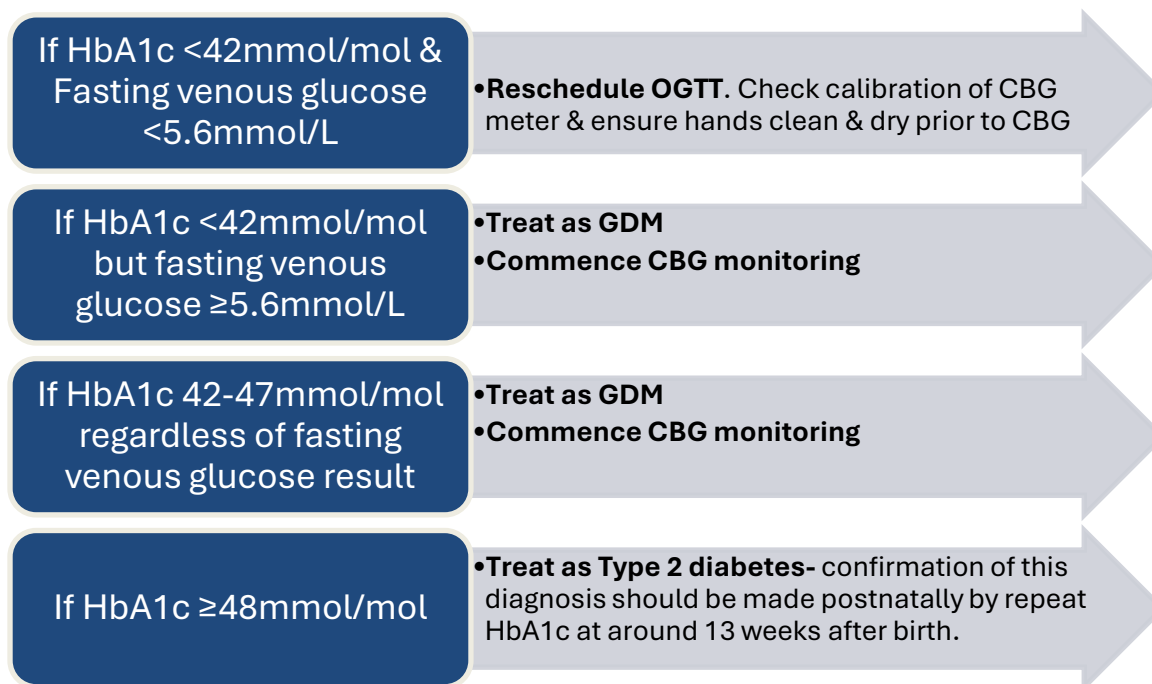
This should be performed on the morning of the OGTT, prior to commencing the test. Please ask the woman to wash their hands and dry them thoroughly, to ensure no residue is on their hands- as this can affect the accuracy of the CBG reading.

**If the capillary blood glucose is  $\geq 7.0$ mmol/l do not perform an OGTT.** Instead, take venous blood samples for: Glucose, HbA1c and Urea and Electrolytes. Refer the same day to diabetes team, via

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Badgernet. Explain to the pregnant woman, that the diabetes team will contact them with the results of the blood tests.



**Repeat OGTT:**

- Generally, OGTT's should not be carried out more than three times in any one pregnancy. Individualised cases should be discussed with the Obstetric Consultant.
- Repeat OGTT should not be carried out within four weeks of the previous OGTT.

**Diagnosis of gestational diabetes via OGTT:**

Via Oral Glucose Tolerance Test:

Women with a fasting venous blood glucose ≥5.6mmol/l or a 2 hour post prandial load ≥7.8 mmol/l should be diagnosed with GDM.

Following diagnosis of GDM via OGTT or other form of diagnosis, the following steps should be completed. This is the responsibility of all staff accessing results:

- File result on ICE if applicable
- Ensure results are documented in BadgerNet
- Create an alert in BadgerNet
- Add gestational Diabetes to risk assessment in BadgerNet
- Refer to diabetes team
- Refer to Obstetric consultant even if already under cons care so new risk factor is documented and correct ANC appts are made, review should ideally be within 7 days.
- ICE request serial growth scans for 28, 32, 36 weeks should be made.
- If over 28 weeks request scan and ANC appt asap, ideally within 7 days. Serial scans with review thereafter.
- Add leaflets to timeline - GDM dietary information - Diabetes UK and RCOG link - Gestational diabetes Worcester hospital video - Dietary information for pregnant inpatients with diabetes - Gestational diabetes – support information ·
- Inform patient

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**Information for women on diagnosis:**

Once identified as GDM, women should be given the following information so that they can make an informed decision regarding management.

- Some people will respond to changes in diet and exercise
- The majority of women may need oral hypoglycaemics or insulin therapy if changes in diet and exercise do not control blood glucose levels effectively
- If GDM is not controlled there is a small increased risk of serious adverse birth complications
- A diagnosis of GDM will lead to increased monitoring and may lead to increased interventions during pregnancy and labour
- Those who have had previous GDM are at risk of developing GDM in future pregnancies. More than 1 in 3 people will get gestational diabetes again (RCOG).

Contact details for diabetes team:

**Diabetes Specialist Nurse Teams**

**South Worcestershire** 01905 760775

Email: [wah-tr.wrhacutediabetes@nhs.net](mailto:wah-tr.wrhacutediabetes@nhs.net)

**Wyre Forest** 01562 826385

Email: [wah-tr.wyreforestdiabetes@nhs.net](mailto:wah-tr.wyreforestdiabetes@nhs.net)

**Redditch/Bromsgrove** 01527 505782

Email: [Wah-tr.redditchbromsgrovediabetes@nhs.net](mailto:Wah-tr.redditchbromsgrovediabetes@nhs.net)

**Diabetes Midwives**

Email: [wah-tr.diabetesmidwives@nhs.net](mailto:wah-tr.diabetesmidwives@nhs.net)

**Maternity Triage (24 hours)**

01905 733196

**Management and treatment for women with GDM:**

- Discuss the implications of the diagnosis for the current pregnancy and recurrence in future pregnancies
- Advise on diet which is a crucial part of the management of women with gestational diabetes. Refined sugars and fatty foods should be limited and dietary fibre content increased. Protein pairing with carbohydrates lowers their glycaemic index. The aim is to have a moderate portion low glycaemic index carbohydrate.
- Women should be encouraged to take at least 30 minutes of exercise per day. There are videos available online for dietary information, which should be shared with all those diagnosed with GDM. [Gestational Diabetes - Worcestershire Acute Hospitals NHS Trust](#)
- Advise pregnant women with gestational diabetes 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 gestational diabetes to test their fasting and 1-hour post-meal blood glucose levels daily if they are:
  - Managing their diabetes with diet and exercise changes alone **or taking** oral therapy (with or without diet and exercise changes) or single-dose intermediate-acting or long-acting insulin

**Ideal CBG target range for gestational diabetes is following can be used as a guide:**

- **Fasting** <5.3 mmol/L

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- **1-hour post-meal** < 7.8 mmol/L
- **Pre meal** <5.3mmol/L
- **Bedtime** <5.3mmol/L

### When to start Metformin:

- Treatment should be offered if the CBG targets are not met following 1-2 weeks of lifestyle changes.
- Urea and Electrolytes should be measured, prior to commencing Metformin treatment, to ensure normal kidney function
- If metformin is contraindicated or unacceptable, commence insulin.

### When to start Insulin:

- Treatment should be commenced in those who CBG readings remain outside the pregnancy target range despite appropriate lifestyle changes and trial of Metformin. Metformin and Insulin may be used independently or in combination, depending on individual requirements of the woman/birthing person.
- If fasting glucose at OGTT is  $\geq 7$  mmol/L, offer immediate treatment with insulin (with or without metformin) in addition to lifestyle advice.
- For people with a fasting plasma glucose level between 6.0mmol/L and 6.9mmol/L, with complications such as macrosomia or polyhydramnios, insulin treatment, with or without metformin should be considered. People who commence treatment immediately should be followed up in the Diabetes Antenatal Clinic
- **Insulin therapy should be decided by the diabetes team and tailored to the individual patient.**
- Explain that insulin will be discontinued post-birth
- Insulin being administered (or self-administered by a patient) in hospital, must be prescribed on the Maternity subcutaneous insulin prescription and monitoring chart as appropriate.

### Insulin Safety

- Women should be seen face to face to discuss commencing insulin. Safe and correct injection technique should be taught and observed. They should be given the WAHT leaflet 'Starting Insulin when you have Gestational Diabetes' or this should be added to their additional reading on Badgernet.
- They should be given advice regarding recognising and treating hypoglycaemia, driving safety, safe and correct storage and safe and correct disposal of sharps. GPs should be informed via letter, to provide any ongoing prescriptions.

### Hypoglycaemia

- Hypoglycaemia is defined as blood glucose level  $\leq 4$  mmol/L
- People treated with insulin are at risk of hypoglycaemia during pregnancy. Nausea and vomiting contribute to this. Once insulin is commenced, they should be informed of signs, symptoms and appropriate treatment of hypoglycaemia e.g. 15-20 grams of fast acting carbohydrate such as dextrose tablets/gel, orange juice or jelly babies. Follow [Hypoglycaemia guideline](#).

### Hyperglycaemia

- Hyperglycaemia in pregnancy defined as blood glucose level of  $\geq 7.8$  mmol/L
- People should be advised to avoid hyperglycaemia by appropriate diet and exercise. However, if the blood glucose levels are outside of target range they are advised to contact their local Diabetes Specialist Nurse team via phone or email.
- People treated with insulin who become unwell or have persistent vomiting should be advised to seek urgent medical advice via Maternity Triage.

### Obstetric management of people with GDM

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### Serial growth scans:

- These should be performed from 28 weeks at approximately 4 weekly intervals. (28, 32, 36 and 39 weeks)
- Computerized CTG monitoring should be offered at 38 weeks.
- The frequency of these may be increased according to individual circumstances.

### Monitoring fetal movements:

- It should be advised to monitor the baby's movements and the association of reduced fetal movements with stillbirth. [Reduced Fetal Movements \(RFM\)](#)
- If there are any concerns, they should urgently telephone and attend triage. Where they should be offered CTG monitoring (If >26 weeks gestation) and review by either Midwife or Obstetrician.

### Corticosteroids for Suspected Preterm Birth and Elective C-section prior to 39/40

Diabetic women receiving steroids are at risk of hyperglycaemia. For these people steroids should be given in liaison with diabetic team and will likely need Continuous variable rate intravenous insulin infusion (CVRIII).

Women requiring steroids after 34+6 gestation should be counselled that although antenatal corticosteroids may reduce admission to the neonatal unit for respiratory morbidity, it is uncertain if there is any reduction in respiratory distress syndrome, transient tachypnoea of the newborn or neonatal unit admission overall, and antenatal corticosteroids may result in harm to the neonate which includes hypoglycaemia and potential developmental delay.

All people with GDM (diet/medicated) requiring steroids should be admitted to the antenatal ward for monitoring. Blood glucose should be monitored 2 hourly and if there are two consecutive readings of more than 7.0mmol/L, 1 hour apart, a Continuous Variable Rate Intravenous Insulin Infusion (CVRIII) should be commenced.

Check U+Es prior to starting CVRIII to monitor fluid balance and electrolyte abnormalities. Repeat 24 hourly

### Elective Caesarean Section

The risk of respiratory morbidity is increased in babies born by caesarean section before labour, but this risk decreases significantly after 39 weeks. Therefore, unless clinically indicated, elective CS should be booked from 39 weeks pregnant. **If elective CS is booked between 37 to 39 week the patient should be counselled about the benefits and risks of corticosteroids**

### [Elective Caesarean Guideline](#)

### Preterm Birth

There is strong evidence that maternal steroids reduced the incidence and severity of respiratory distress syndrome, intraventricular haemorrhage, necrotising enterocolitis and neonatal death. Therefore, steroids should be given if preterm Labour is diagnosed or strongly suspected

- **The recommended gestation range for giving maternal corticosteroids is 24 to 34+6 weeks**
  - At <24 weeks- may be used at individual instigation of a Consultant (Obs/Neonatologist)
  - 24+0 and 34+6 weeks- Offer steroids
  - 35+0 and 36+6 weeks- Consider balance of risks and benefits (short term respiratory benefits for the neonate but increased likelihood of neonatal hypoglycaemia)
- **Dose:**
  - In the UK it is recommended that 24 mg dexamethasone phosphate is given intramuscularly in two divided doses on 12 mg 24 hours apart or four divided doses of 6 mg 12 hours apart.
- An alternative is 24 mg Betamethasone given intramuscularly in two divided doses of 12 mg 24 hours apart
  - The 2<sup>nd</sup> dose of steroids should be administered 24 hours after the first dose but can be given between 12 and 24 hours if circumstances dictate this to be more practical.

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Before administration of steroids, discuss with consultant obstetrician if:

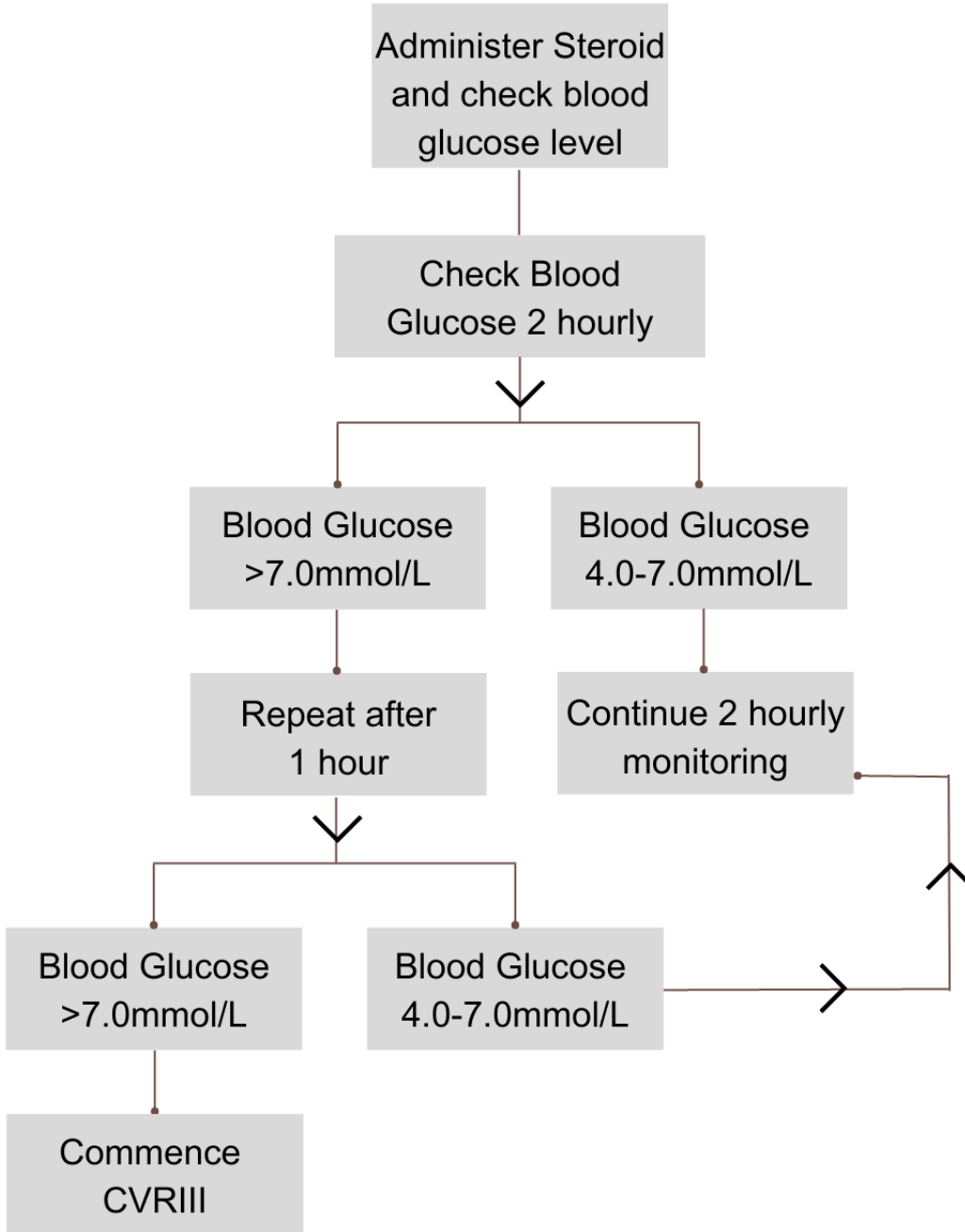
- signs of infection
- woman is diabetic
- needs second course of steroids (a course of steroids should be completed between 24hours – 7 days prior to birth for maximum benefit)

[Preterm Guideline \(information re: steroids\)](#)

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**Flowchart for steroid use in pregnancy**



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### Plan for Birth:

- The timing and mode of birth should be reviewed at 36 weeks (or sooner if indicated).
- Advise women with gestational diabetes to give birth no later than 40 weeks plus 6 days. (NICE)
- Offer induction of labour no later than 40+3 to allow delivery by 40+6, or before that if indicated.
- If delivery is indicated between 37- 38+6 gestation, patient needs to be counselled about risks of early-term delivery (SBL3)
- If the birthing woman labours spontaneously up to 40+6 weeks gestation, and has well controlled diabetes, reviewed by the Diabetes team and controlled through diet only, with no additional risk factors, they may opt to birth on Meadow Birth Centre according to a full holistic assessment and MBC inclusion criteria.  
[MLC Care in Labour Guideline \(including MBC inclusion criteria\)](#)
- If a birthing woman wishes to birth on MBC, but does not meet MBC criteria, or is not wishing to birth by 40+6 weeks refer via Badgernet to the Consultant Midwife and named Consultant Obstetrician for further discussion and planning.
- Continuous electronic fetal monitoring (CEFM) is not required for patients with uncomplicated GDM on diet control but is recommended for those people requiring diabetes medication [CEFM Guideline](#)
- If a person on insulin or metformin chooses to continue their pregnancy beyond the above recommendations, they should be made aware that there is limited evidence around the reliability of tests for fetal wellbeing.
- Women should be advised to monitor fetal movements carefully and to report any change via maternity triage. An individualised care plan should be made by the named Consultant Obstetrician.
- U+Es should be checked before starting CVRIII. Results do not need to be available prior to commencement. During ongoing use (>6 hours) in labour, these should be repeated 4 to 6 hourly to maintain electrolyte balance. If ketoacidosis is suspected, blood ketones should be checked

### Induction of Labour:

#### [Induction of Labour Guideline](#)

- Continue normal subcutaneous insulin regimen unless CVRIII is required
- If IV oxytocin is commenced following ARM a separate cannula must be inserted if a CVRIII is required.

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**Management of glycaemic control in labour for people with diet controlled GDM or for those on Metformin**

Labour Event	Diet and Medication	Care Plan
Induction of labour	Diet Controlled - To have normal diet and mobilisation.  Metformin treated - Continue Metformin as per prescription and normal diet.	4x daily capillary blood glucose monitoring - Before breakfast and 1 hour after food.
Early labour (spontaneous onset/ IOL)	Diet Controlled - To have normal diet and mobilisation  Metformin treated - Continue Metformin as per prescription and normal diet.	4x daily capillary blood glucose monitoring. Before breakfast and 1 hour after food.
Established labour/ After ARM in IOL	Diet Controlled - Avoid solid diet, encourage oral fluid intake + / - IV fluids  Metformin treated - Omit if not eating solid diet.	Hourly capillary blood glucose levels (CBG) should be performed.  Aim to maintain CBG levels between 4.0-7.0 mmol/L.  If a CBG is >7.0 mmol/L, recheck after one hour  A CVRIII and glucose regime is needed if capillary blood glucose levels >7.0mmol/L on 2 consecutive occasions one hour apart.
Immediate post-partum	If commenced, stop CVRIII following the delivery of the placenta. Stop Metformin if applicable.  Encourage to eat and drink normally.	No need for further Capillary blood sugar checks.  This baby may be at risk so follow <a href="#">neonatal pathway for babies</a>
Discharge	No further blood sugar monitoring.	Explain increased risk of type 2 diabetes in later life and advice regarding diet exercise and weight loss.  Ensure GP aware to perform either a fasting glucose level or HbA1c at 6-12 weeks postpartum.  Discuss contraception

**Management of glycaemic control in labour for people with GDM on insulin (also for non-medicated GDM people being induced for high blood sugars/macrosomia/ suspected GDM after 40 weeks)**

Labour Event	Diet and Medication	Care Plan
Induction of labour	Insulin treated GDM should have a normal diet and continue insulin as prescribed in pregnancy.	7x daily capillary blood glucose monitoring (fasting, i.e. before breakfast, pre-meal for every meal, 1-hour post-meal for every meal, and prior to bedtime).
	Non-medicated GDM (IOL for unstable blood glucose/macrosomia/ <b>late diagnosis of GDM</b> ) provide normal diet.	Before breakfast and 1hour after food.
Early labour (spontaneous onset)	Insulin treated GDM should have a normal diet and continue insulin as prescribed in pregnancy	7x daily capillary blood glucose monitoring (fasting, i.e. before breakfast, pre-meal for every meal, 1-hour post-meal for every meal, and prior to bedtime).
	Non-medicated GDM (IOL for unstable blood glucose/macrosomia/ <b>late diagnosis of GDM</b> ) should have a normal diet.	7x daily capillary blood glucose monitoring (fasting, i.e. before breakfast, pre-meal for every meal, 1-hour post-meal for every meal, and prior to bedtime).
Established labour (or after ARM in IOL)	Insulin treated GDM: <ul style="list-style-type: none"> <li>• Avoid solid diet</li> <li>• Oral fluid to thirst</li> <li>• Continue to administer their subcutaneous intermediate or long-acting insulin.</li> <li>• Omit the short acting insulin.</li> </ul>	Hourly capillary blood glucose levels (CBG) should be performed.  Aim to maintain CBG levels between 4.0-7.0 mmol/L.  If a CBG is >7.0 mmol/L, recheck after one hour  A CVRIII and glucose regimen is needed if capillary blood glucose levels >7.0mmol/L on 2 consecutive occasions one hour apart
	Non-medicated GDM (IOL for unstable blood glucose/macrosomia/ <b>late diagnosis of GDM</b> ) <ul style="list-style-type: none"> <li>• Avoid solid diet,</li> <li>• Oral fluids to thirst</li> </ul>	Hourly capillary blood glucose levels (CBG) should be performed.  Aim to maintain CBG levels between 4.0-7.0 mmol/L.  If a CBG is >7.0 mmol/L, recheck after one hour  A CVRIII and glucose regime is needed if capillary blood glucose levels >7.0mmol/L on 2 consecutive occasions one hour
Immediate post-partum	Stop CVRIII following the delivery of the placenta if it had been commenced. No further insulin treatment. Encourage to eat and drink normally.	No need for further Capillary blood glucose checks.  Baby may be at risk - follow <a href="#">neonatal pathway for babies</a>
Discharge	No further insulin treatment	Explain increased risk of type 2 diabetes in later life and advice regarding diet exercise and weight loss. Ensure GP aware to perform either a fasting glucose level or HbA1c at 6-12 weeks postpartum. Discuss contraception

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### Titration of blood glucose during labour with **Continuous Variable Rate Intravenous Insulin Infusion (CVRIII)**

- Use the **Maternity** Trust CVRIII prescription regime
- Aim for blood glucose between 4.0-7.0mmol/L
- If CBG  $\geq 7.0$  mmol/L on 2 consecutive occasions, one hour apart- commence CVRIII on regime 1 with hourly CBG checks
- If less than 4 stop the CVRIII manage as per hypoglycaemia pathway
- Aim to keep the CBG's  $< 7.0$ mmol/L
- If  $> 7$  mmol/L after 4 hours on CVRIII commence regime 2
- If after a further 4 hours CBG still  $> 7.0$  mmol/L commence regime 3
- Seek medical review if CBG's  $> 11.0$ mmol/L and perform urinalysis for ketones

### People with **GDM** requiring elective **Caesarean Section (C/S)**

- When birthing people require C/S for obstetric indication, the timing of caesarean section depends on the clinical picture.
- Aim to offer elective C/S from 39 weeks' gestation for women with **GDM**. Elective C/S may be considered earlier if indicated.

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**Plan of care for people with GDM when they undergo caesarean section**

Elective Caesarean Section	Diet controlled or Metformin treated GDM		<ul style="list-style-type: none"> <li>Admit on the day of surgery</li> <li>Aim for birthing person to be first on either the morning or afternoon list</li> </ul>
		<b>Morning list</b>	<ul style="list-style-type: none"> <li>Aim to be first on the list</li> <li>Take usual dose of Metformin with evening meal the day before surgery.</li> <li>Omit Metformin dose on the morning of the surgery</li> <li>Record capillary blood glucose on admission. If fasting CBG is &gt;7.0 mmol/L a CVRIII should be commenced. If CBG is within normal limits- check hourly until birth.</li> <li>If general anaesthesia is used, capillary blood glucose should be monitored every half an hour until the woman is fully conscious</li> </ul>
		<b>Afternoon list</b>	<ul style="list-style-type: none"> <li>Aim to be first on the list</li> <li>Take all medications the day before surgery as prescribed</li> <li>Take usual dose of metformin with breakfast before 0730am</li> <li>No food from 0730am on the day of surgery but may drink clear fluids freely until called for theatre</li> <li>If fasting CBG is &gt;7.0 mmol/L a CVRIII should be commenced.</li> </ul>
	Insulin treated GDM		<ul style="list-style-type: none"> <li>Admit on the day of surgery</li> <li>Aim to be first on the morning or afternoon list</li> </ul>
		<b>Morning list</b>	<ul style="list-style-type: none"> <li>Aim to be first on the list</li> <li>No food from 0230am on the day of surgery but may drink clear fluids freely until called for theatre</li> <li>Take usual dose of intermediate or long-acting insulin on the night before surgery</li> <li>On the morning of surgery omit all insulins</li> <li>Check capillary blood glucose on admission</li> <li>If fasting CBG &gt;7.0 mmol/L commence CVRIII</li> <li>If &lt;7mmol/L and &gt;4.0mmol/L monitor and record CBG hourly until birth</li> <li>If &lt;4.0mmol/L treat as per hypoglycaemia guideline and inform Anaesthetist</li> </ul>
		<b>Afternoon list</b>	<ul style="list-style-type: none"> <li>Take usual dose of intermediate or long-acting insulin on the night before surgery</li> <li>On the morning of surgery take usual dose of insulin with breakfast ensuring that this is before 0730am</li> <li>Nothing to eat after 0730am but may drink clear fluids freely until called for theatre</li> <li>Check capillary blood glucose on arrival. If fasting CBG &gt;7.0 mmol/L commence CVRIII</li> <li>If &lt;7mmol/L and &gt;4.0mmol/L monitor and record CBG hourly until birth</li> <li>If &lt;4.0mmol/L treat as per hypoglycaemia guideline and inform Anaesthetist</li> </ul>
Insulin treated GDM - Unstable		<ul style="list-style-type: none"> <li>Admit on the day of surgery</li> <li>Aim to be first on the list</li> <li>No food from 0230am on the day of surgery but may drink clear fluids freely until called for theatre</li> <li>Take usual dose of intermediate or long-acting insulin on the night before surgery</li> <li>On the morning of surgery omit all insulin</li> <li>Check CBG hourly from admission</li> <li>If fasting CBG &gt;7.0mmol/L commence CVRIII</li> <li>If &lt;7mmol/L and &gt;4.0mmol/L monitor and record CBG hourly until birth</li> <li>If &lt;4.0mmol/L treat as per hypoglycaemia guideline and inform Anaesthetist</li> </ul>	
Emergency Caesarean Section	Diet controlled or Metformin treated GDM		<ul style="list-style-type: none"> <li>May be on CVRIII if was required in labour (see above)</li> <li>Stop CVRIII after delivery of placenta</li> <li>Ensure accurate and clear hand over between the recovery staff and the postnatal midwife.</li> </ul>
	Insulin treated GDM		<ul style="list-style-type: none"> <li>May be on CVRIII if was required in labour</li> <li>Stop CVRIII after delivery of placenta</li> <li>Ensure accurate and clear hand over between the recovery staff and the postnatal midwife.</li> </ul>

### Duties and Responsibilities:

- All pregnant people should be encouraged to take control of their care and enjoy their pregnancy
- Members of the MDT should work in partnership with birthing people.
- Birthing people should be involved in decisions about their care and offered the opportunity to make informed choices through the provision of appropriate information.
- **In all cases ensure a plan has been made and documented on Badgernet regarding diabetes medications around the time of caesarean section in discussion with the diabetes specialist team.**

### Postnatal Care

- Review any postnatal plan documented on Badgernet.
- All people who had GDM should stop all diabetes medications and blood glucose monitoring after the delivery of the placenta.
- If pre-existing diabetes is suspected plan of management to be advised by Diabetes Specialist Nurses.
- On discharge by community midwife, explain the benefits of low fat, low sugar, high fibre diet, exercise and avoidance of weight gain in terms of reducing maternal risk of future diabetes. Recommend early booking in future pregnancies and early screening for GDM.
- The GP should be informed about the need for 6 weeks postnatal glucose checks which can be either a fasting blood glucose at 6 weeks or HbA1c at 12-13 weeks postnatally. Thereafter, annual glycaemic checks must be organised in primary care.
- NHS Diabetes Prevention Programme (NHS DPP) should be discussed and a referral offered; women should also be informed of the option to self-refer later if preferred.

### Management of Baby:

- Follow neonatal guideline on [monitoring babies at risk of hypoglycaemia](#)
- Use Red Blanket
- Babies of women with diabetes should feed as soon as possible after birth (within 30 minutes) and then at frequent intervals no longer than 3 hours
- If not fed, hand expression of colostrum should be encouraged

### Breastfeeding and Diabetes:

- Infants of people with GDM are at increased risk of hypoglycaemia, admission to a neonatal intensive care unit (NICU) and not being exclusively breastfed
- Early feeds are recommended, and Colostrum can stabilise infant glucose concentrations more effectively than infant formula milk
- People with GDM should have a discussion with a midwife about infant feeding and the importance of giving breast milk
- Cows' milk (the main ingredient of formula milk) can trigger diabetes in some babies; therefore, it is very important that people who have had diabetes avoid giving their baby formula milk, if possible, until the baby is at least 6 months old
- Exclusive breast milk for these babies should be discussed.
- A midwife in the antenatal period should discuss the importance of the hand expression of colostrum **after 36 weeks**

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- People who have GDM should receive a copy of 'Diabetes and feeding your baby' (Xerox code WR1940) and given an expression pack. They will be shown by a staff member how to hand express and store colostrum correctly

### **Considerations:**

The antenatal expression of colostrum may be **contraindicated** in the following circumstances and should be considered on an individual basis:

- History of threatened premature labour
- Cervical incompetence
- Multiple pregnancies
- Cervical suture in situ

If the birthing person has gestational diabetes, they are less likely to go on to develop diabetes in later life if they breastfeed their baby.

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Appendix 1: CVRIII Chart

Maternity Adult Prescription and Monitoring Chart for CVRIII

NAME: \_\_\_\_\_ NHS NO: \_\_\_\_\_ HOSP NO: \_\_\_\_\_ D.O.B: \_\_\_\_/\_\_\_\_/\_\_\_\_ MALE  FEMALE

Ward: \_\_\_\_\_ Cons: \_\_\_\_\_

**MATERNITY ADULT PRESCRIPTION AND MONITORING CHART FOR CONTINUOUS VARIABLE RATE INTRAVENOUS INSULIN INFUSION (CVRIII)**

ALLERGIES/ADVERSE DRUG REACTIONS  
NONE KNOWN  Signature: \_\_\_\_\_

DATE	DRUG/FOOD/OTHER	REACTION DETAILS

**PRE-ADMISSION DIABETES REGIMEN:**

Approved Drug Name	Form/Insulin Device	Dose	Frequency	Pharmacy Supply

**REASON FOR INITIATING CVRIII** (please tick)

Type 1 or 2 or Gestational diabetes and vomiting/intercurrent illness/unable to eat

Type 1 or 2 or Gestational diabetes awaiting surgery or a procedure where CVRIII is indicated

Type 1 or 2 or Gestational diabetes during labour/delivery with blood glucose >7.0mmol/l on two consecutive occasions

Diabetes in pregnancy receiving steroids for fetal lung maturation with blood glucose >7.0mmol/l on two consecutive occasions

(Please use the appropriate Care Pathway for Diabetic Ketoacidosis and Hyperosmolar Non-Ketotic State)

**HYPERGLYCAEMIA MANAGEMENT**

- Refer to WAHT-END-0011(Guidelines for the use of Continuous Variable Rate Intravenous Insulin Infusion)

**HYPOLYCAEMIA MANAGEMENT:**

- Refer to WAHT-END-0011 & WAHT-END-004 (Treatment of Hypoglycaemia Flow Chart)
- Record Management of Hypoglycaemia on page 6 of this document

**GUIDANCE POINTS FOR PRESCRIBING CVRIII**

- Prescribe 'insulin as per chart' on the main inpatient prescription chart
- Prescribe the variable rate regimen, insulin infusion and accompanying intravenous fluids on page 2 & 3 of this prescription
- Prescribe continued basal insulin on the subcutaneous insulin prescription for pregnant women (WR5552)
- If indicated, prescribe additional fluids on the Prescription Chart for Intravenous Infusions (WR0992)
- Cross through all sections of this prescription not in use
- Cross off and re-write the prescription if changes are required

**GUIDANCE POINTS FOR THE ADMINISTRATION OF CVRIII:**

- Document insulin syringe preparation and each infusion rate change on page 2
- Connect the insulin syringe pump to an intravenous access separate from the accompanying intravenous fluids. If venous access is difficult, use a 2 or 3 tailed device with **Non Return Valves**
- Refer to WAHT-TP-094 for Guidance on (1) Frequency of capillary blood glucose monitoring (2) Changing between the three variable rate regimens (3) Discontinuing CVRIII and re-initiating the usual diabetes regimen

PF WR5553 Maternity Adult Prescription and Monitoring Chart for CVRIII Version 2 Page 1 of 6

NAME: \_\_\_\_\_ NHS NO: \_\_\_\_\_ HOSP NO: \_\_\_\_\_ D.O.B: \_\_\_\_/\_\_\_\_/\_\_\_\_ MALE  FEMALE

Ward: \_\_\_\_\_ Cons: \_\_\_\_\_

All women commence on Regimen 1. If 4 consecutive CBG readings above 7.0mmol/l, move to Regimen 2. If 4 further CBG readings above 7.0mmol/l, move to Regimen 3.

**PRESCRIPTION FOR VARIABLE RATE REGIMENS OF INTRAVENOUS INSULIN:**

Capillary Blood Glucose mmol/l	Insulin Infusion (units/hour - 1 unit = 1ml)		
	Regimen 1	Regimen 2	Regimen 3
<4	STOP INSULIN FOR 20 MINUTES Treat hypo as per guideline (re-check CBG in 10 minutes)		
4.0 - 5.5	0.2	0.5	1.0
5.6 - 7.0	0.5	1.0	2.0
7.1 - 8.5	1.0	1.5	3.0
8.6 - 11.0	1.5	2.0	4.0
11.1 - 14.0	2.0	2.5	5.0
14.1 - 17.0	2.5	3.0	6.0
17.1 - 20.0	3.0	4.0	7.0
>20.1	4.0	6.0	8.0

Doctors Signature \_\_\_\_\_

Start: _____ Date: _____	Stop: _____ Date: _____	Start: _____ Date: _____	Stop: _____ Date: _____	Start: _____ Date: _____	Stop: _____ Date: _____
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**PRESCRIPTION FOR INTRAVENOUS INSULIN INFUSION:**

Actrapid 50 units made up to 50mls with sodium chloride 0.9% to be given by intravenous infusion via a syringe pump. Check capillary blood glucose (CBG) 1 hour after commencing the infusion.

Prescribed by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

**DOCUMENTATION OF SYRINGE RATE CHANGES:**

**SYRINGE MUST BE CHANGED EVERY 24 HOURS REGARDLESS OF DOSE**

Date	Time (00:00)	CBG Reading Requiring Rate Change	Infusion Rate ml/hr	Regimen 1 / 2 / 3	Syringe Prepared By	Syringe Checked By	Rate Set By	Rate Checked By







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**Monitoring**

Page/ Section of Key Document	Key control:	Checks to be carried out to confirm compliance with the Policy:	How often the check will be carried out:	Responsible for carrying out the check:	Results of check reported to: <i>(Responsible for also ensuring actions are developed to address any areas of non-compliance)</i>	Frequency of reporting:
	<b>WHAT?</b>	<b>HOW?</b>	<b>WHEN?</b>	<b>WHO?</b>	<b>WHERE?</b>	<b>WHEN?</b>
	National GDM Audit	MSDS/Badgernet	Quarterly	Diabetes Lead	CATS/National	Yearly

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**Contribution List**

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This key document has been circulated to the following individuals for consultation;

Designation
All Maternity Staff
Maternity Governance Meeting

This key document has been circulated to the chair(s) of the following committee's / groups for comments;

Committee
Maternity Governance Meeting