Worcestershire Acute Hospitals NHS Trust

Diabetes in Pregnancy - Gestational

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
Athen Warren	Diabetes Specialist Midwife
Daisy Bradley	Audit, Guideline and Patient Experience Midwife
Approved by *Maternity Governance Meeting* on:	4th August 2023
Approved by Medicines Safety Committee on: *Where medicines included in guideline*	2020 (Prescription CRVII charts)
Review Date: This is the most current document and should be used until a revised version is in place	4th August, 2026

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

Background:

A diagnosis of gestational diabetes is associated with an increased risk of fetal macrosomia, caesarean section, induction of labour, instrumental delivery, transient neonatal hypoglycaemia and increased risk of obesity and diabetes later in the baby's life (NICE, 2015). Up to 3% of women have pre-existing diabetes. Up to 50% of women may develop Type 2 diabetes within 5 years postpartum. Good glycaemic control throughout pregnancy reduces these risks 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) in order to achieve a pregnancy outcome in the diabetic that approximates to that of the non-diabetic pregnant women – St. Vincent declaration 1989.

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 women with GDM
- The timing and mode of birth
- Intrapartum and postpartum care of women with gestational diabetes
- Neonatal care of babies born to gestational diabetic women

Guideline Scope:

This guideline applies to all women who develop gestational diabetes and who are booked and cared for by 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.
- Multi-disciplinary Team (MDT): Consultant Obstetrician/Consultant Diabetologist, Diabetes link Midwife, Diabetes Specialist Nurse and Dietician.

Care Pathways

Screening:

At booking and all subsequent antenatal appointments, determine the need for an oral glucose tolerance test (OGTT). This test should be performed with a 75g-glucose load.

OGTT should be offered between 24-28 weeks gestation. However, if there is recurrent glycosuria prior to this, then OGTT should be offered earlier. The 75 gm of glucose is provided by Polycal in all the three sites. The OGTT can be performed up until 35^{+6} weeks. Depending on the urgency the OGTT can be performed in Day Assessment Unit (DAU) Trust wide if required.

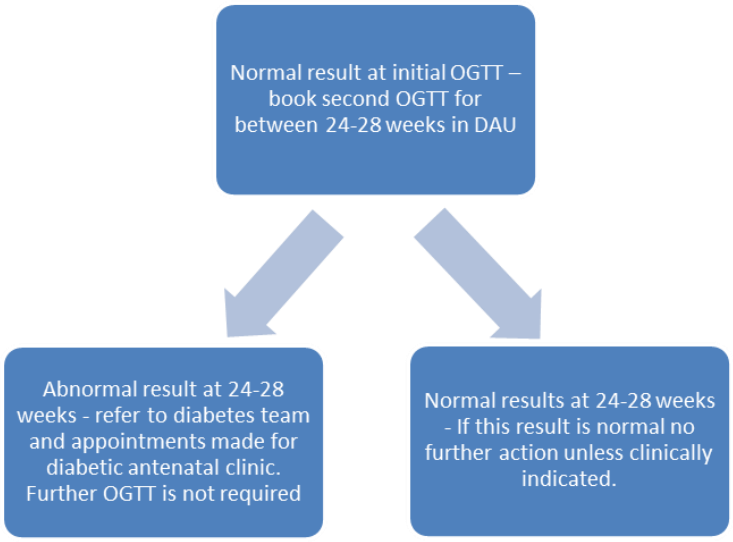
Indications for oral glucose tolerance testing:

- Glycosuria on more than one occasion /or Glycosuria of 2++ or more on one occasion.
- Suspected large-for-dates fetus confirmed by ultrasound measurement showing a fetal abdominal circumference >97th centile (see individualised GROW chart) or polyhydramnios.
- First degree relative with a history of Type 1 or Type 2 diabetes (parent or sibling of the pregnant woman).
- Previous unexplained stillbirth.
- Maternal obesity BMI >30kg/m2
- Confirmed polycystic ovary disease.
- 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 >95th Centile

Women with previous gestational diabetes:

DAU referral for OGTT should be made to be performed as early as possible in the pregnancy. If the result is within normal parameters a repeat OGTT should be performed between 24-28 weeks which should be booked by DAU staff at time of first OGTT.

Abnormal results at initial OGTT refer to Diabetes Team and make appointments for Diabetic Antenatal Clinic. **A further OGTT is not required.**



Good practice states that all women with potential GDM should have a random glucose level prior to performing OGTT. Therefore, this should be performed on the morning of the OGTT. If the blood sugar is >11.0mmol/l do not perform an OGTT. Refer urgently to the diabetic antenatal clinic.

Screening after 35+6:

- DO NOT perform an OGTT after 35+6 weeks' gestation
- Women should be seen by the Day Assessment Unit at the respective site to establish CBG monitoring
- Women are asked to monitor their blood glucose levels for 3 days whilst continuing their normal diet
- Women will be advised who to contact within the respective sites with their results
- If ≥3 values above the target (see CBG monitoring form) assume the patient has GDM
- Arrange review by the MDT

Repeat OGTT:

- Generally, OGTT's should not be carried out more than twice in any one pregnancy. Individualised cases should be discussed with the Obstetric Consultant.
- Repeat OGTT should not be carried out within two weeks of the previous OGTT.
- Women, who present with persistent glycosuria **after 28/40**, having already completed at least two OGTT's for previous glycosuria, should not be offered further screening for GDM unless subsequent independent risk factors have developed.

Diagnosis of gestational diabetes via OGTT:

Women with a fasting venous blood glucose ≥5.6mmol/l or a 2 hour post prandial load ≥7.8 mmol/l should be referred to the Diabetes Antenatal Clinic.

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 women 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
- Women who have had previous GDM are at risk (between 30-84%) of developing GDM in future pregnancies

Management and treatment for women with GDM:

- Following diagnosis refer to the diabetes link midwife.
- 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. The aim is to have a moderate portion low glycaemic index carbohydrates.
- Women should be encouraged to take at least 30 minutes of exercise per day. A group session is held by the dietitians weekly on all sites to offer advice. Written information and contact details are given if further input is required.
- For women with diet GDM or on metformin commence 4x daily capillary blood glucose monitoring (i.e. before breakfast and 1hour after breakfast, lunch and dinner). Further monitoring depends on the individual patient and clinical needs.
- For women with multiple daily insulin injections test CBG 7 times per day (i.e. fasting, pre and 1 hour post each meal and at bedtime) (NICE 2015)

Ideal CBG target range is unknown in pregnant women with diabetes but the following can be used as a guide:

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

When to start Metformin:

- Treatment should be offered to women following 1-2 weeks of lifestyle changes if the CBG targets are not met.
- If metformin is contraindicated or unacceptable, commence insulin.

When to start Insulin:

- Treatment should be commenced in those women for whom CBG readings remain outside the ideal target range despite appropriate lifestyle changes and trial of Metformin.
- If fasting glucose at OGTT is ≥7 mmol/L, offer immediate treatment with insulin (with or without metformin) in addition to lifestyle advice.
- Women 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. Women who commence treatment immediately should be followed up in the Diabetes Antenatal Clinic
- **Insulin therapy should be decided by the diabetic team and tailored to the individual patient.**
- Explain that insulin will be discontinued post-delivery
- Insulin in hospital must be prescribed on the Maternity Trust CVRIII or subcutaneous insulin prescription chart as appropriate.

Hypoglycaemia

- Hypoglycaemia is defined as blood glucose level ≤4 mmol/L
- Women treated with insulin are at risk of hypoglycaemia during pregnancy. Nausea and vomiting contribute to this. Once insulin is commenced women 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 is defined as blood glucose level of ≥7.8 mmol/L
- Women 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 Diabetes Specialist Nurse.
- Women treated with insulin who become unwell or have persistent vomiting should be advised to seek urgent medical advice through Maternity Triage.

Obstetric management of women with GDM

Serial growth scans:

- These should be performed from 28 weeks (or from gestation of diagnosis) at approximately 4 weekly intervals.
- The frequency of these may be increased according to individual circumstances.

Monitoring fetal movements:

- **Women must be advised to monitor the baby's movements and the associated or reduced fetal movements with stillbirth.**
- **Women should urgently telephone and attend triage if there are any concerns. Women should be offered CTG monitoring and review via Triage.**

Corticosteroids for Suspected Preterm Delivery

Corticosteroids should be offered to women with GDM to aid fetal lung maturation if:

- Spontaneous delivery is likely to occur prior to 34+6 weeks' gestation

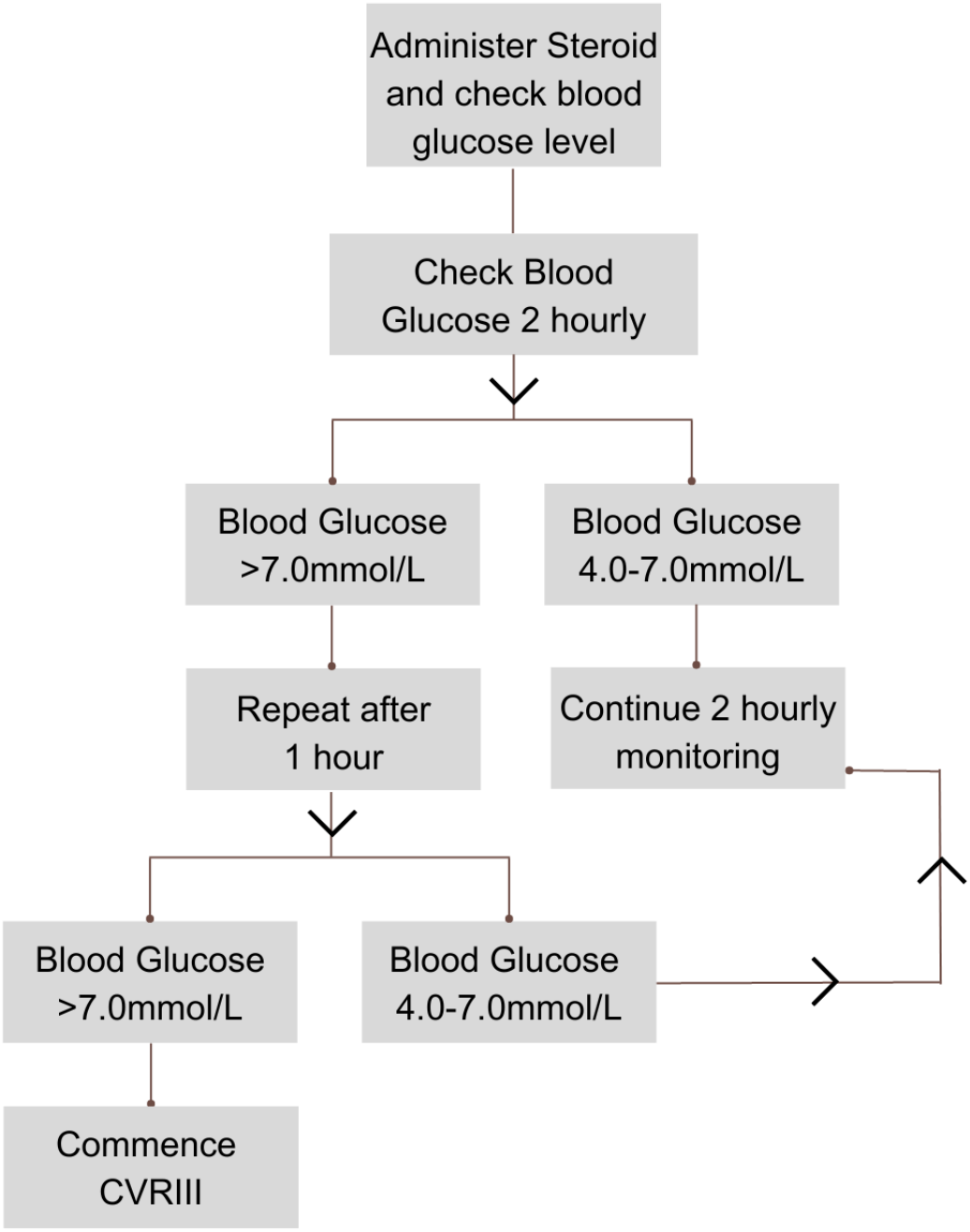
Corticosteroids should be considered for women with GDM to aid fetal lung maturation

- Prior to elective section performed earlier than 39 weeks' gestation
- Or if patients have co-existent IUGR up to 35+6 weeks' gestation

Women 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 women 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 a Continuous Variable Rate Intravenous Insulin Infusion (CVRIII) should be commenced.

Dexamethasone phosphate (12mg/24 hours apart) is the steroid of choice. Total dose 24mg.

Flowchart for steroid use in pregnancy



Plan for Birth:

- The mode of delivery should be reviewed at 36 weeks (or sooner if indicated).
- If diet controlled, without maternal or fetal complications delivery should be achieved no later than 40+6 weeks gestation.
- Consider earlier delivery if any other metabolic complications.
- If the mother is insulin controlled or on Metformin aim for delivery by 38+6 weeks.
- If a woman on insulin or metformin chooses to continue her pregnancy beyond 39/40 weeks they should be made aware that there are no reliable tests to reassure regarding fetal wellbeing.
- Women should be advised to monitor fetal movements very carefully and to report any change in the usual way. An individualised care plan should be made by the supervising Consultant obstetrician.

Induction of Labour:

- If appropriate, continue normal subcutaneous insulin regime until in established labour and then manage diabetes as for spontaneous labour.
- If IV oxytocin is commenced following ARM a separate cannula must be inserted if a CVRIII is required.
- In women with GDM diagnosed after 36 weeks by 3-day monitoring, induction of labour should be planned with consultant input. The timing of the induction of labour depends on the scan findings and other associated clinical findings. These women are advised to continue to monitor their blood glucose levels until delivery. When they are induced for high blood glucose with or without, macrosomia these women should be treated as somebody who is on treatment for glycaemic control.

NICE recommendation for timing of IOL:

Advise women with gestational diabetes to give birth no later than 40 weeks plus 6 days. Offer elective birth by induced labour or (if indicated) by caesarean section to women who have not given birth by this time.

Intrapartum care:

Management of glycaemic control in labour for women 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. 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 4-7 mmol/L. If a CBG is >7 mmol/L, recheck after 30 minutes. A CVRIII and glucose regime is needed if capillary blood glucose levels >7.0mmol/L on 2 consecutive occasions 30 minutes apart.
Immediate post-partum	If commenced stop CVRIII following the delivery of the placenta. Encourage to eat and drink normally.	No need for further Capillary blood sugar checks. This baby may be at risk so follow neonatal pathway for babies
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 women with GDM on insulin (also for non-medicated GDM women being induced for high blood sugars/macrosomia)

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/**late diagnosis of GDM**) 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/ **late diagnosis of GDM**) 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: • Avoid solid diet • Encourage oral fluid intake + / - IV fluids • Continue to administer their subcutaneous intermediate or long acting insulin. • Omit the short acting insulin.	Hourly capillary blood glucose levels (CBG) should be performed. Aim to maintain CBG levels between 4-7 mmol/L. If a CBG is >7 mmol/L, recheck after 30 minutes. A CVRIII and glucose regime is needed if capillary blood glucose levels >7.0mmol/L on 2 consecutive occasions 30 minutes apart.
	Non-medicated GDM (IOL for unstable blood glucose/ macrosomia/ **late diagnosis of GDM**) • Avoid solid diet, • Encourage oral fluid intake + / - IV fluids	Hourly capillary blood glucose levels (CBG) should be performed. Aim to maintain CBG levels between 4-7 mmol/L. If a CBG is >7 mmol/L, recheck after 30 minutes. A CVRIII and glucose regime is needed if capillary blood glucose levels >7.0mmol/L on 2 consecutive occasions 30 minutes apart.
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 neonatal pathway for babies
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

Titration of blood glucose during labour with CVRIII

- Use the **Maternity** Trust CVRIII prescription regime
- Aim for blood glucose between 4-7mmol/L
- If less than 4 stop the CVRIII manage as per hypoglycaemic pathway
- If CBG ≥7 mmol/L commence CVRIII on regime 1 with hourly CBG checks
- Aim to keep the CBG's <7
- If >7 mmol/L after 4 hours commence regime 2
- If after a further 4 hours CBG still >7 mmol/L commence regime 3
- Seek medical review if CBG's >11mmol/L and perform urinalysis for ketones

Women with GDM requiring elective Caesarean Section (C/S)

- When women require C/S for obstetric indication, the timing of caesarean section depends on growth scan, glycaemic control and treatment for GDM.
- Aim to offer elective C/S from 39 weeks' gestation for women with **diet control GDM** with good glycaemic control and no evidence of maternal or fetal compromise. Delivery should be achieved no later than 39+6 weeks to minimise the risk of spontaneous labour.
- Elective C/S should be offered 38 -38^{+6} weeks' gestation for women with **GDM who are on treatment** (i.e. Metformin or Insulin).
- Steroids should be considered to aid fetal lung maturation if a C/S is being planned prior to 39 weeks' gestation

Worcestershire Acute Hospitals NHS Trust

Plan of care for women with GDM when they undergo caesarean section

<table>
<tr><td rowspan="5">Elective Caesarean Section</td><td rowspan="3">Diet controlled or Metformin treated GDM</td><td colspan="2">• Admit on the day of surgery
• Aim for woman to be first on either to morning or afternoon list</td></tr>
<tr><td>If on the morning</td><td>• Aim for woman to be first on the list
• Take usual dose of Metformin with evening meal if prescribed.
• Omit Metformin dose (if prescribed) on the morning of the surgery
• Record capillary blood glucose on admission. If fasting CBG is >7.0 mmol/L a CVRIII should be commenced</td></tr>
<tr><td>If on the afternoon</td><td>• Aim for woman to be first on the list
• Take all medications the day before surgery as prescribed
• Take usual dose of metformin with breakfast before 7am if prescribed
• Clear fluids can be taken until 11am but nothing to eat after 7am. Record capillary blood glucose on admission. If fasting CBG is >7.0 mmol/L a CVRIII should be commenced.</td></tr>
<tr><td rowspan="3">Insulin treated GDM</td><td colspan="2">• Admit over night to ANW
• Aim for woman to be first on the morning or afternoon list</td></tr>
<tr><td>If on the morning list</td><td>• Aim for woman to be first on the list
• Fast from 2am
• Take usual dose of intermediate or long acting insulin on the night before surgery
• On the morning of surgery omit all insulins
• Check capillary blood glucose on arrival to delivery suite and then hourly until delivered
• If CBG >7.0 mmol/L commence CVRIII
• If <7mmol/L monitor and record CBG hourly until delivery</td></tr>
<tr><td>If on the afternoon list</td><td>• Take usual dose of intermediate or long acting insulin on the night before surgery
• On the morning of surgery take usual dose of insulin with breakfast ensuring that this is before 7am
• Clear fluids can be taken until 11am but nothing to eat after 7am
• Check capillary blood glucose on arrival to delivery suite and hourly until delivered
• If CBG >7.0 mmol/L commence CVRIII
•
If <7mmol/L monitor and record CBG hourly until delivery</td></tr>
<tr><td>Insulin treated GDM - Unstable</td><td colspan="2">• Admit over night to ANW
• Aim for woman to be first on the list
• Fast from 2am
• Take usual dose of intermediate or long acting insulin on the night before surgery
• On the morning of surgery omit all insulins
• Check capillary blood glucose hourly in the morning
• If CBG >7.0 mmol/L commence CVRIII

If <7mmol/L monitor and record CBG hourly until delivery</td></tr>
<tr><td rowspan="2">Emergency Caesarean Section</td><td>Diet controlled or Metformin treated GDM</td><td colspan="2">• May need CVRIII if CBG >7mmol/L in labour (see above)
• Stop CVRIII after delivery
• Ensure good hand over between the recovery staff and the postnatal midwife.</td></tr>
<tr><td>Insulin treated GDM</td><td colspan="2">• May need CVRIII if CBG >7mmol/L in labour
• Stop CVRIII after delivery
• Ensure good hand over between the recovery staff and the postnatal midwife.</td></tr>
</table>

Duties and Responsibilities:

- All pregnant women should be encouraged to take control of their care and enjoy their pregnancy
- Members of the MDT should work in partnership with women.
- Women 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 diabetic medications around the time of caesarean section in discussion with the diabetes specialist team.**

Obstetrician should:

- Document previous medical and obstetric history
- Discuss and document an individual management plan for pregnancy, delivery and the post-natal period in the hospital case notes and also in the hand held notes.
- To communicate to the woman the details of the likely timetable of antenatal appointments, including maternal and fetal assessments.
- Review home blood glucose monitoring
- To communicate to the woman the risks of gestational diabetes to her and her pregnancy and confirm the targets for glycaemic control
- To discuss risks for future development of Type 2 Diabetes and the need for preconception care when planning future pregnancies.
- Ensure an individual plan of care is made to include maternal assessment, fetal assessment, treatment required, and frequency of investigations and timings of reviews. This should be clearly documented both the hospital and hand held notes.
- Arrange ultrasound scans (USS) to monitor fetal growth and well-being.
- Discuss the timing and mode of birth, including induction of labour, caesarean section, analgesia and anaesthesia with the woman.
- Book admission date for induction of labour. This should be after a full discussion with the woman and after gaining her consent; the woman should be provided with an induction of labour information leaflet and contact details.
- Advise on the importance of lifestyle changes to reduce the risk of developing type 2 diabetes for both the women and her baby in later life.

Diabetes Link Midwife should:

- Contact the women after initial diagnosis and arrange for appointment with DSN and dietitian.
- Provide information on the diagnosis and the plan of care that will commence.
- Perform full antenatal check at each visit and document
- Carry out antenatal care as specified by the Diabetes Multi-Disciplinary Team (MDT)
- Refer to DSN or Obstetric Team if concerns regarding a woman's glycaemic control occur.
- Educate/ensure patients are disposing of sharps correctly and correct sharps disposal equipment is given.
- During third trimester to discuss benefits and importance of hand expressing breast milk. Antenatal hand expressing packs to be given.

Dietitian should:

- Review patient at earliest opportunity after diagnosis
- Agree plan of care regarding dietary changes with patient.
- Provide ongoing advice to the woman as required.

Diabetes Team (Diabetes Specialist Nurses and Consultant Endocrinologist) should:

- Give education on home blood glucose monitoring and provide equipment.
- Review home blood glucose monitoring
- To communicate with the woman the targets for glycaemic control
- Advise women treated with insulin the risks of hypoglycaemia and hyperglycaemia unawareness in pregnancy.
- Decide if/when to initiate insulin and /or metformin and review regimen and titrate doses as necessary.

Postnatal Care

Management of Mother:

- Review any postnatal plan documented on badgernet.
- All women should stop all diabetes medications and blood glucose monitoring postnatally
- If pre-existing diabetes is suspected plan of management to be advised by Diabetes Specialist Nurse.
- 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.
- The GP should be informed about the need for 6 weeks postnatal glucose checks which can be either a fasting blood glucose or HbA1c performed 6-12 weeks postnatally. Annual glycaemic checks must be organised in primary care.

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 maternal hand expression should be encouraged if mother's choice is to breast feed

Breastfeeding and Diabetes:

- Infants of women with diabetes in pregnancy 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
- Mothers with diabetes 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 mothers who are diabetic avoid giving their baby formula milk if at all possible, until the baby is at least 6 months old
- Worcestershire acute trust encourages exclusive breast milk for these babies
- A midwife in the antenatal period should discuss the importance of the hand expression of colostrum **after 36 weeks** or before if the mother is being induced
- Mothers with diabetes should receive a copy of 'Diabetes and feeding your baby' (Xerox code WR1940) and given an expression pack. The mother will be shown by a staff member how to hand express and store her colostrum

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 she has gestational diabetes she is less likely to go on to develop diabetes in later life if she breastfeeds her baby.

Appendix 1: CVRIII Chart

Affix Patient Label here or record

NAME: . . . . . .

NHS NO:

HOSP NO:

D.O.B: D D / M M / Y Y Y Y MALE FEMALE

Ward:..... Cons.....

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

NHS Worcestershire Acute Hospitals NHS Trust

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)

HYPOGLYCAEMIA 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

Affix Patient Label here or record

NAME: . . . . . .

NHS NO:

HOSP NO:

D.O.B: D D / M M / Y Y Y Y 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:

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

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

Affix Patient Label here or record

NAME: .....

NHS NO:

HOSP NO:

D.O.B: D D / M M / Y Y Y Y MALE ☐ FEMALE ☐

Ward:..... Cons.....

PRESCRIPTION FOR CONTINUING BASAL (LONG ACTING) INSULIN:

- Continue the patients basal insulin **and** metformin, if patient is NBM or not eating, omit metformin.
- Basal insulins are: Humalin I, Insulatard, Levemir (Detemir), Lantus, Toujeou (Glargine), Tresiba (Degludec)
- Continued basal insulin should be prescribed on the Maternity prescription and monitoring chart for subcutaneous insulin injections (WR5552)

PRESCIPTION FOR CVRIII ACCOMPANYING FLUIDS:

- Prescribe 500 ml 0.9% NaCl + 5% Dextrose with 20 mmol KCl/L (0.15%) at 50 ml/hr
- Prescribe additional rehydration/resuscitation fluids (to be given via a separate cannula), if indicted on the Prescription for Intravenous Infusions chart (WR0992)

Date	Approved Drug Name	Route	Rate	Doctor's Signature	Prepared by Signature	Checked by Signature	Date & Time (00:00)
		IV	ml/hr				
		IV	ml/hr				
		IV	ml/hr				
		IV	ml/hr				
		IV	ml/hr				
		IV	ml/hr				
		IV	ml/hr				
		IV	ml/hr				
		IV	ml/hr				
		IV	ml/hr				

DOCUMENTATION OF CAPILLARY BLOOD GLUCOSE READINGS

Blood Glucose <4.0mmol/l needs action and treatment for hypoglycaemia, record 1st blood glucose readings below and further readings and treatment on Page 6.

- Record the capillary blood glucose (CBG) reading and time in the correct section of the chart.
- Review the variable rate regimen being used (1/2/3) if 4 consecutive CBG readings are above 7.0mmol/l
- Monitor CBG every hour.
- Monitor CBG every 2 hours for the first 24 hours after stopping CVRIII and commencing the patient's usual diabetes regimen. This may be continued by the woman at home if clinically appropriate.

DATE: D D / M M / Y Y Y Y

Affix Patient Label here or record

NAME: .....

NHS NO:

HOSP NO:

D.O.B: D D / M M / Y Y Y Y MALE ☐ FEMALE ☐

Ward:..... Cons.....

Time: (00:00) → / CBG mmol/l	>11.1	10.0-11.0	9.0-9.9	8.0-8.9	7.0-7.9	6.0-6.9	5.0-5.9	4.1-4.9	<4.0	Midwife Signature

PF WR5553 Maternity Adult Prescription and Monitoring Chart for CVRIII Version 2 Page 4 of 6

Appendix 2: Insulin Prescription Chart

Attach Patient Sticker here or record

NAME: . . . . . .

NHS NO:

HOSP NO:

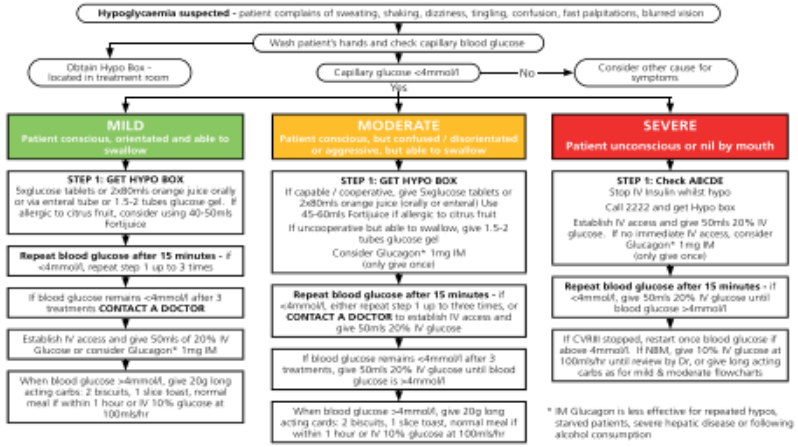
D.O.B: D D M M Y Y Y Y Female ☐

Consultant:..... Ward:.....

HYPOGLYCAEMIA MANAGEMENT

- Record the initial capillary blood glucose reading in the correct section for capillary blood glucose recording on page 2 or 3. If less than 4mmol/l refer to WAHT-END-004 for the Treatment of Hypoglycaemia Flow Chart below for further guidance.
- Treatment for hypoglycaemia should be given under PGD and recorded in the appropriate section below. Alternatively this can be prescribed by a Doctor.
- **For Paediatric patients (1 up to 16yrs of age) use half the recommended dose in the flow diagram below.**

TREATMENT OF HYPOGLYCAEMIA - Hypoglycaemia defined as blood glucose less than 4mmol/l



If IV or IM treatment required, an online datix incident form must be completed.

Patient Group Directions for glucose tablets, glucose gel, 10% and 20% IV glucose and Glucagon can be found on the Trust Intranet.

MEDICINES GIVEN BY STAFF TO MANAGE HYPOGLYCAEMIA (under PGD) AS PER FLOW CHART

Date	Time	DRUG	Dose	Route	Signature	Print Name	Time

DOCUMENTATION OF CAPILLARY BLOOD GLUCOSE MONITORING

- After the hypoglycaemic episode has been treated record further capillary blood glucose readings in the table below.
- Repeat and record capillary blood glucose again 15 minutes after hypoglycaemia treatment is given.
- Continue to check and record capillary blood glucose readings every 15 minutes until 3 consecutive readings of 4.1mmol/l or greater are obtained. Once blood glucose is above 4 mmol/L increase blood glucose monitoring to 1 hourly until blood glucose is above 7 mmol/L. Then continue regular monitoring before meals and before bedtime.
- For recurrent hypoglycaemia refer the patient to the Diabetes Specialist Nurses for review.

DATE	TIME (00:00)	INITIALS	CAPILLARY BLOOD GLUCOSE READING MMOL/L	DATE	TIME (00:00)	INITIALS	CAPILLARY BLOOD GLUCOSE READING MMOL/L

MATERNITY PRESCRIPTION AND MONITORING CHART FOR SUBCUTANEOUS INSULIN INJECTIONS

Worcestershire Acute Hospitals NHS Trust

Attach Patient Sticker here or record

NAME: . . . . . .

NHS NO:

HOSP NO:

D.O.B: D D M M Y Y Y Y Female ☐

Consultant:..... Ward:.....

ALLERGIES/ADVERSE DRUG REACTIONS

NONE KNOWN ☐ Signature: Date:

DATE	DRUG/FOOD/OTHER	REACTION DETAILS

PRE-ADMISSION DIABETES REGIMEN:

Approved drug name	Form / insulin device	Dose	Frequency

Diabetic Kit required: YES / NO Print Name_____ Signature_____ Date_____

Supplied by Pharmacy: Print Name_____ Signature_____ Date:_____

INSULIN ADMINISTRATION:

☐ Midwife Administration (Ref: MedPolSOPO9) Start_____ Stop_____

☐ Self Administration (Ref: MedPolSOPO9) Start_____ Stop_____

☐ Self Management Scheme (Ref: WAHT-CG-447) Start_____ Stop_____

ONCE ONLY SUBCUTANEOUS INSULIN DOSES

DATE	TIME	INSULIN	DOSE	ROUTE	PRESCRIBER'S SIGNATURE	ADMINISTERED BY (TWO SIGNATURES)	DATE & TIME
				SC			
				SC			
				SC			

HYPERGLYCAEMIA MANAGEMENT:

- Reference to WAHT-END-001 (Guidelines for the Treatment of Diabetic Ketoacidosis) & WAHT-END-006 (Management of the Initiation of Insulin in Adults.)
- Please test urine or blood ketones if a patient has a blood glucose reading of 12mmol/L or above

HYPOGLYCAEMIA MANAGEMENT:

- Record Management of Hypoglycaemia on page 4 of this document.
- Refer to WAHT-END-004 (Treatment of Hypoglycaemia Flow Chart on back page)

SAFE PRESCRIBING, ADMINISTRATION, TRANSFER AND STORAGE OF INSULIN

- When prescribing insulin, the word 'units' must never be abbreviated.
- Ensure TWO Midwives sign for administration of insulin for patients who cannot self-administer their insulin.
- Never use an IV syringe to administer insulin. Always use an insulin pen device with a BD autoshield safety needle in patients who cannot self-administer.
- Insulin doses must never be omitted or delayed unless clearly outlined on the prescription and documented in the medical notes by the prescriber.
- Prescribe insulin doses to include all the doses required that day plus the morning dose of the following day.
- Cross through all insulin prescription boxes not required that day.
- An insulin dosage range should only be prescribed if a patient is on the 'Self Management Scheme' (see above) and the necessary forms have been signed and filed in the patients notes.
- Seek further advice and supplies from Pharmacy.

PRESCRIPTION FOR SUBCUTANEOUS INSULIN INJECTIONS AND MONITORING CHART FOR MANAGEMENT OF DIABETES

Attach Patient Sticker here or record

NAME: . . . . . .

NHS NO:

HOSP NO:

D.O.B: D D M M Y Y Y Y Female ☐

Consultant:..... Ward:.....

Target CBG **4.0 - 7.8mmol/L** unless otherwise indicated

Specify target range: . . . . . mmol/L to . . . .mmol/L

Signature: Date:

GUIDANCE ON CAPILLARY BLOOD GLUCOSE MONITORING: - Monitor blood glucose a **minimum** of 4 times daily (Pre-breakfast and 1 hour past meals)
If pre-bedtime CBG is 5.0mmol/l or below check CBG at 03:00

Specify insulin form and device(s): 1.	2.	3.
PHARMACY SUPPLY		

PRESCRIBED INSULIN MUST NEVER BE OMITTED WITHOUT PRESCRIBER'S DOCUMENTED AUTHORISATION IN MEDICAL NOTES

INSULIN DOSE IN UNITS

CAPILLARY BLOOD GLUCOSE (MMOL/L)
Blood glucose <4mmol/L needs action and treatment. Record 1st low blood glucose here and further blood glucose readings on page 4.

Pharmacy Check	DATE	INSULIN TYPE	Breakfast	Lunch	Tea	Bedtime		03:00	Pre-breakfast	Pre-Lunch	Pre-Tea	Bedtime	Other Please specify
		Prescriber Signature/Bleep	UNITS	UNITS	UNITS	UNITS	Reading mmol/L						
			Midwife Signatures	Midwife Signatures	Midwife Signatures	Midwife Signatures	Time						
			Time given.....	Time given.....	Time given.....	Time given.....			Post-breakfast	Post-Lunch	Post-Tea		
		Prescriber Signature/Bleep	UNITS	UNITS	UNITS	UNITS	Reading mmol/L						
			Midwife Signatures	Midwife Signatures	Midwife Signatures	Midwife Signatures	Time						
			Time given.....	Time given.....	Time given.....	Time given.....	Signature						
Pharmacy Check	DATE	INSULIN TYPE	Breakfast	Lunch	Tea	Bedtime		03:00	Pre-breakfast	Pre-Lunch	Pre-Tea	Bedtime	Other Please specify
		Prescriber Signature/Bleep	UNITS	UNITS	UNITS	UNITS	Reading mmol/L						
			Midwife Signatures	Midwife Signatures	Midwife Signatures	Midwife Signatures	Time						
			Time given.....	Time given.....	Time given.....	Time given.....			Post-breakfast	Post-Lunch	Post-Tea		
		Prescriber Signature/Bleep	UNITS	UNITS	UNITS	UNITS	Reading mmol/L						
			Midwife Signatures	Midwife Signatures	Midwife Signatures	Midwife Signatures	Time						
			Time given.....	Time given.....	Time given.....	Time given.....	Signature						
Pharmacy Check	DATE	INSULIN TYPE	Breakfast	Lunch	Tea	Bedtime		03:00	Pre-breakfast	Pre-Lunch	Pre-Tea	Bedtime	Other Please specify
		Prescriber Signature/Bleep	UNITS	UNITS	UNITS	UNITS	Reading mmol/L						
			Midwife Signatures	Midwife Signatures	Midwife Signatures	Midwife Signatures	Time						
			Time given.....	Time given.....	Time given.....	Time given.....			Post-breakfast	Post-Lunch	Post-Tea		
		Prescriber Signature/Bleep	UNITS	UNITS	UNITS	UNITS	Reading mmol/L						
			Midwife Signatures	Midwife Signatures	Midwife Signatures	Midwife Signatures	Time						
			Time given.....	Time given.....	Time given.....	Time given.....	Signature						

NEVER WITHDRAW INSULIN USING A SYRINGE FROM AN INSULIN PEN DEVICE OR CARTRIDGE

INSULIN DOSE IN UNITS

CAPILLARY BLOOD GLUCOSE (MMOL/L)
Blood glucose <4mmol/L needs action and treatment. Record 1st low blood glucose here and further blood glucose readings on page 4.

Pharmacy Check	DATE	INSULIN TYPE	Breakfast	Lunch	Tea	Bedtime		03:00	Pre-breakfast	Pre-Lunch	Pre-Tea	Bedtime	Other Please specify
		Prescriber Signature/Bleep	UNITS	UNITS	UNITS	UNITS	Reading mmol/L						
			Midwife Signatures	Midwife Signatures	Midwife Signatures	Midwife Signatures	Time						
			Time given.....	Time given.....	Time given.....	Time given.....			Post-breakfast	Post-Lunch	Post-Tea		
		Prescriber Signature/Bleep	UNITS	UNITS	UNITS	UNITS	Reading mmol/L						
			Midwife Signatures	Midwife Signatures	Midwife Signatures	Midwife Signatures	Time						
			Time given.....	Time given.....	Time given.....	Time given.....	Signature						
Pharmacy Check	DATE	INSULIN TYPE	Breakfast	Lunch	Tea	Bedtime		03:00	Pre-breakfast	Pre-Lunch	Pre-Tea	Bedtime	Other Please specify
		Prescriber Signature/Bleep	UNITS	UNITS	UNITS	UNITS	Reading mmol/L						
			Midwife Signatures	Midwife Signatures	Midwife Signatures	Midwife Signatures	Time						
			Time given.....	Time given.....	Time given.....	Time given.....			Post-breakfast	Post-Lunch	Post-Tea		
		Prescriber Signature/Bleep	UNITS	UNITS	UNITS	UNITS	Reading mmol/L						
			Midwife Signatures	Midwife Signatures	Midwife Signatures	Midwife Signatures	Time						
			Time given.....	Time given.....	Time given.....	Time given.....	Signature						
Pharmacy Check	DATE	INSULIN TYPE	Breakfast	Lunch	Tea	Bedtime		03:00	Pre-breakfast	Pre-Lunch	Pre-Tea	Bedtime	Other Please specify
		Prescriber Signature/Bleep	UNITS	UNITS	UNITS	UNITS	Reading mmol/L						
			Midwife Signatures	Midwife Signatures	Midwife Signatures	Midwife Signatures	Time						
			Time given.....	Time given.....	Time given.....	Time given.....			Post-breakfast	Post-Lunch	Post-Tea		
		Prescriber Signature/Bleep	UNITS	UNITS	UNITS	UNITS	Reading mmol/L						
			Midwife Signatures	Midwife Signatures	Midwife Signatures	Midwife Signatures	Time						
			Time given.....	Time given.....	Time given.....	Time given.....	Signature						

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: *(Responsible for also ensuring actions are developed to address any areas of non-compliance)*	Frequency of reporting:
	WHAT?	**HOW?**	**WHEN?**	**WHO?**	**WHERE?**	**WHEN?**

Contribution List

Contribution List

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