HUTT maternity
Hutt Valley Maternity Care

HUTT VALLEY DHB

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Diabetes: Intrapartum and Post Natal Policy

Hutt Maternity Policies provide guidance for the midwives and medical staff working in Hutt Maternity Services. Please discuss policies relevant to your care with your Lead Maternity Carer.

Management of Intrapartum and Postpartum Care

Policy

To ensure that all women presenting with pre-existing and gestational diabetes are appropriately monitored, managed and treated during their labour and postpartum period.

Scope

All Midwifery and Obstetric medical staff
All Hutt Valley District Health Board access holders
Endocrinologists and Medical Registrars
Diabetes Nurse Clinicians
Dietician

Definitions

Gestational Diabetes (GDM) - is defined as any degree of glucose intolerance first recognised during pregnancy. This definition applies equally to those women who require insulin or metformin therapy and those who simply require dietary modification. Some of these women will be diagnosed post delivery to have Type 2 diabetes, impaired glucose tolerance (IGT), impaired fasting glucose (IFG) and occasionally Type 1 diabetes.

Type 2 Diabetes – the most common form of diabetes, it occurs when either the pancreas stops producing enough insulin, or the body becomes resistant to the insulin produced. It has been called Non Insulin Dependent Diabetes Mellitis or NIDDM in the past. It is a chronic disease developing over several years which may be treated using diet and exercise, oral medications such as metformin or glibenclamide, or may require insulin treatment.

Type 1 Diabetes – an autoimmune disease, in which the pancreas' production of insulin decreases to very little or zero. It more commonly begins in childhood but can develop at any age. It used to be referred to as Insulin Dependent Diabetes Mellitis or IDDM.

IGT – Impaired Glucose Tolerance

IFG – Impaired Fasting Glucose

Risks and precautions

Fetal/neonatal Risks:	Maternal Risks:
• Macrosomia, shoulder dystocia & birth injuries e.g. nerve palsies, fractures	• Miscarriage
• Hypoglycaemia	• UTI, candida infections
• Respiratory distress	• Raised risk of PET
• Hyperbilirubinaemia	• Increased risk of IOL and of C/S
• Congenital anomalies	• Birth trauma
• IUGR esp. with hypertensive or vascular disorders	• Type 2 Diabetes in later life
• Unexplained intrauterine death	
• Future risk of obesity and diabetes	

Contacts

Raymond Bruce (Endocrinologist) – contact via switchboard
Diabetes Nurse Educators: contact via Diabetes reception ext. 9951
Dietician: ext. 9180

Gestational Diabetes controlled with diet alone or with Metformin

Spontaneous and Induction of labour

- In the first instance the obstetrician on call for the day is consulted regarding the management and care of women with diabetes. The obstetrician on call will then consult with the diabetes team or other specialists as and when required.
- **Usually women with GDM which is well controlled by diet alone require no special treatment during their labour and birth.**
- Women with GDM, diet controlled or on metformin, may eat and drink as normal, then as they wish once in active labour. If labour or fetal wellbeing deviate from the normal, they should become nil by mouth (NBM).
- Women on metformin may have been advised to stop taking it on the morning of induction, but if not, should stop taking it if they are NBM, or in active labour. Metformin alone will not cause hypoglycaemia.
- The woman has her usual breakfast on the morning of the induction.
- Blood glucose levels (BG) are checked before meals, 2 hours after meals, and at bedtime.
- The BGs are recorded on the diabetes record chart and in the body of the woman's notes.
- Meals appropriate for diabetic women should be ordered.

Once in established labour:

- Stop metformin once in active labour, if not prior.
- If IV fluids are required for reasons other than glycaemic control, avoid fluids containing dextrose.
- In active labour, blood glucose levels should be checked hourly using the woman's own meter if available. If not, use the ward glucometer.
- The BGs are recorded on the diabetes record chart (Appendix 4) and in the body of the woman's notes.
- Aim for blood glucose levels 3.5 – 7.0 mmol/l. If they are raised above 7.0 mmol/l, check again in an hour. If still raised, discuss with the on call obstetrician regarding the need for an insulin/dextrose infusion
- Check in the notes for a Management Plan from the endocrinologist. If none is available, start with Sliding Scale Protocol A as per Appendix 1 Diabetes Management in Labour
- Use common sense. The timing of each woman's labour will be different. If labour is progressing quickly this may not be necessary.
- Continuous CTG monitoring is not necessary for these women unless there are other obstetric (e.g. syntocinon, epidural) or fetal concerns including macrosomia.

Poor glycaemic control

Most women on diet or metformin management will have good glycaemic control. However there may be women known to have poor control and possibly not compliant with glucose monitoring or taking medications, or those diagnosed late in pregnancy with little opportunity for adequate management. These women should be managed in the same way in labour as those using insulin in pregnancy.

Elective Caesarean Section

- Usually women with GDM who are well controlled by diet alone require no special treatment.
- Metformin will not be taken once nil by mouth. If the caesarean is booked for the afternoon, the woman will usually have been advised to omit her breakfast dose by the endocrinologist.
- If steroids are required prior to elective caesarean section at less than 39 weeks, this will need to be planned in conjunction with the diabetic and obstetric team as steroids will raise blood sugars usually increasing about 8 hours after the dose and may require management using insulin. See HVDHB Protocol **Management for Diabetes in Pregnancy requiring Steroid Therapy**

Postnatal

- A normal, healthy diet is resumed following the labour and birth.
- If insulin has been commenced in labour it is stopped at delivery.
- Metformin is not restarted except on rare occasions by the direction of the endocrinologist.
- Nearly all women with gestational diabetes are normoglycaemic after giving birth. However, these women are at risk of recurrent gestational diabetes, impaired glucose tolerance, and overt diabetes. BSLs should continue to be taken before meals, for at least 24 hours until they have normalised. The BSLs are recorded on the diabetes record chart and in the body of the woman's notes.

Care of the baby

- Consider having paediatric presence at birth
- Encourage skin to skin and early feed within an hour of birth.
- The infant should have a supervised breast/EBM/formula feed within the first hour, and then has his/her blood glucose checked within 1 hour of this, i.e. within 2 hours of birth.
- Heel prick blood glucose monitoring is performed pre feed 3-4 hourly until there have been 3 consecutive blood glucose recordings > 2.5mmol/L
- Check whether the mother has expressed antenatally. Use expressed colostrum in preference if baby needs supplementary feeds. It should <u>not</u> be used instead of a breastfeed.
- Encourage the mother to hand express after feeds or if the baby will not or cannot breastfeed adequately.
- The neonatal hypoglycaemia –prevention and management of – protocol is observed if the infant's BSL is < 2.6mmol/L (inform paediatric SHO on call).

Contraception

No contraceptive method is specifically contraindicated in women with GDM thus selection should be based upon the same guidelines that apply to all women.

Postpartum Blood Tests

- All women who have had GDM in pregnancy are asked to have a fasting glucose blood test at 5-6 weeks postnatal. This is followed up with an appointment at the Antenatal Diabetes Clinic with the endocrinologist.
- A raised fasting glucose at this stage will indicate those women who are more likely to already have pre-existing diabetes or impaired glucose tolerance. The endocrinologist will discuss the results with the woman and write to the GP, in all instances suggesting an HbA1c at 3 months postpartum.
- All women with GDM should have annual follow up thereafter, by HbA1c with their GP.
- Maintenance of lifestyle improvements will be discussed along with the increased risk of developing diabetes and the likelihood of recurrence of GDM in future pregnancies.
- Loan blood glucose monitors must be returned to HVDHB Diabetic Clinic.

GDM or Type 2 Diabetes, controlled on insulin alone, or insulin with metformin

In the first instance the obstetrician on call for the day is consulted regarding the management and care of women with diabetes. The obstetrician on call will then consult with the diabetes team or other specialists as and when required.

Spontaneous Onset of Labour

- When the woman arrives in labour, the obstetrician on call for the day is informed of her admission.
- An IV leur is inserted and a CBC, group & hold, urea & electrolytes are sent to the laboratory.
- BSLs are taken hourly. The BSLs are recorded on the diabetes record chart (Appendix 4) and in the body of the woman's notes.
- If 2 consecutive BSLs are >7mmol/L, discuss with the obstetric registrar or consultant about starting insulin and dextrose infusions. The endocrinologist should have put a management plan with the recommended sliding scale A, B or C into the clinical notes. The rate of the insulin infusion is titrated according to the prescribed sliding scale which is documented on the woman's medication chart. See Appendix : Diabetes management in labour
- If there is no management plan available, contact the diabetes nurse educators or Dr Bruce, the endocrinologist, Monday to Friday, 8-4.30pm. If unable to contact them, commence insulin/dextrose infusion using Protocol A initially. If no response in 2 hours, change to a higher dose protocol, i.e. B or C.
- If the glucose is < 3.5 mmol/L or the woman develops symptomatic hypoglycaemia, treat with glucose tablets or dextrose gel, Hypofit, first and subsequent protein snack e.g. glass of milk or cheese sandwich (Appendix 3: Management of hypoglycaemia)
- If on metformin, she will have been advised to stop taking from the morning of induction, but if not, should stop taking it if they are NBM, or in active labour. Metformin alone will not cause hypoglycaemia.
- Continuous electronic fetal monitoring is maintained throughout the labour and birth.
- May eat and drink as wishes in labour unless there are fetal or obstetric concerns.
  An insulin/dextrose infusion should be discontinued at the birth of the baby.

Induction of Labour

Admission is undertaken and the woman's insulin requirements and Intrapartum sliding scale (if required) are transcribed from the antenatal diabetic clinic notes onto the woman's medication chart.

The woman is asked to arrive on delivery suite at 7.30am for CTG monitoring and routine observations. She will then be reviewed by the obstetrician on call for the day.

If the woman has an LMC midwife, there should have been a 3-way conversation about whether the LMC midwife will be involved in her Intrapartum care. If so, clear responsibilities should be established, for example, the LMC midwife will usually be responsible for the "normal" care with core midwife support for care of an insulin/dextrose infusion plus other secondary care input as required.

- Intravenous cannula is inserted
- CBC, random glucose, urea, electrolytes and a group and hold are taken and documented in the notes.
- The induction process will proceed as per the HVDHB protocol: Induction of labour, with full discussion and consent of the woman.
- Insulin as prescribed by the endocrinologist prior to the induction, on the Diabetes management in labour – management plan for insulin (Appendix 1), should be continued with meals and/or at bedtime until in active labour.
- BSLs should be taken before meals, 2 hours after meals and at bedtime. The BSLs are recorded on the diabetes record chart (Appendix 4) and in the body of the woman's notes.
- If labour does not establish, the woman may continue eating – after consultation with the obstetric registrar.
- Once labour is established, proceed as given for spontaneous onset of labour.
- Administration of IV Ranitidine given 6 hourly should be considered if there is felt to be increased risk of emergency LSCS.

Elective Caesarean Section

- The woman is admitted to Surgical Admissions as usual, but may have had a pre-admission CTG in MAU prior at the obstetrician's request.
- Women who have been on insulin in pregnancy should ideally be scheduled first on the theatre list.
- On the day prior to surgery – the normal morning and midday insulin are given. The evening dose of insulin is administered according to the plan prescribed in the woman's outpatient clinic records. If scheduled onto an afternoon list, an early breakfast will be taken. The insulin dose for this will be either omitted or reduced according to instructions given to the woman by the endocrinologist, to avoid hypoglycaemia once nil by mouth.
- The woman will have been advised to monitor her blood glucose levels 2 hourly, once nil by mouth, from 6am, or more frequently if feeling symptoms of hypoglycaemia. Hypoglycaemia is very unlikely if they have taken a reduced insulin dose with breakfast (if afternoon list), however if occurs, she should treat with jelly beans or dextrose tablets, phone delivery suite to inform them and come straight into hospital as may require an insulin/dextrose infusion.
- If steroids are required prior to elective caesarean section at less than 39 weeks, this will need to be planned in conjunction with the diabetic and obstetric team as steroids will raise blood sugars usually increasing about 8 hours after the dose and may require management using insulin. See HVDHB Protocol **Management for Diabetes in Pregnancy requiring Steroid Therapy**

Postpartum care

- Women with GDM, who are on insulin during pregnancy, usually do not require insulin after birth. Insulin should be discontinued at delivery for women with GDM and Type 2 Diabetes though there are some women with Type 2 who may have been on insulin pre-pregnancy and their post-delivery insulin requirements will be determined by the endocrinologist.

- BSLs should continue to be taken before meals, for at least 24 hours until they have normalised. The BSLs are recorded on the diabetes record chart and in the body of the woman's notes.
- When to discontinue testing to be decided by the diabetic team. The diabetes nurse educators should be notified of the woman's birth and ask to visit her 1-2 days postnatal on the postnatal ward.

Care of the baby

- Consider having paediatric presence at birth
- Encourage skin to skin and early feed within an hour of birth.
- The infant should have a supervised breast/EBM/formula feed within the first hour, and then has his/her blood glucose checked within 1 hour of this, i.e. within 2 hours of birth.
- Heel prick blood glucose monitoring is performed pre feed 3-4 hourly until there have been 3 consecutive blood glucose recordings > 2.5mmol/L.
- Check whether the mother has expressed antenatally. Use expressed colostrum in preference if baby needs supplementary feeds. It should not be used instead of a breastfeed.
- Encourage the mother to hand express after feeds or if the baby will not or cannot breastfeed adequately.
- The neonatal hypoglycaemia –prevention and management of – protocol is observed if the infant's BSL is < 2.6mmol/L (inform paediatric SHO on call).

Contraception

No contraceptive method is specifically contraindicated in women with diabetes thus selection should be based upon the same guidelines that apply to all women.

Postpartum Follow-up

- All women who have had GDM in pregnancy are asked to have a fasting glucose blood test at 5-6 weeks postnatally. This is followed up with an appointment at the Antenatal Diabetes Clinic with the endocrinologist.
- A raised fasting glucose at this stage will indicate those women who are more likely to already have pre-existing diabetes or impaired glucose tolerance. The endocrinologist will discuss the results with the woman and write to the GP, in all instances suggesting an HbA1c at 3 months postpartum.
- Maintenance of lifestyle improvements will be discussed along with the increased risk of developing diabetes.
- The likelihood of recurrence of GDM in future pregnancies is high. Women should be advised of this and about the recommended screening (HbA1c at booking, then if this is 41-49 an OGTT at 14-16 weeks to rule out diabetes that may have developed between pregnancies).
- Factors associated with increased risk of Type 2 include a high fasting glucose in pregnancy, diagnosis in early pregnancy, insulin treatment in pregnancy and weight gain after pregnancy. GP follow up with an HbA1c is recommended annually.
- Loan blood glucose monitors must be returned to HVDHB Diabetic Clinic.
- Women with Type 2 Diabetes do not require a fasting blood glucose prior to their 6 week follow-up appointment at the A/N Diabetes Clinic. Following this,

they will be referred back to their GP or Diabetes service for ongoing follow-up.

Type 1 Diabetes

Women with Type 1 Diabetes are usually truly insulin dependent. They may give their own insulin by sub- cutaneous injection, usually a short acting insulin with each meal plus an intermediate or long acting insulin at morning and night, or they may be giving their insulin via a pump. They are usually "the experts" in their insulin management. However they will need extra support at this time during labour and in the postnatal period as their blood glucose and insulin requirements will change dramatically.

In the first instance the obstetrician on call for the day is consulted regarding the management and care of women with diabetes. The obstetrician on call will then consult with the diabetes team or other specialists as and when required.

Spontaneous Onset of Labour

- Most women with Type 1 Diabetes will be solely under secondary care however some may have an LMC midwife providing midwifery input. If the woman has an LMC midwife, there should have been a 3-way conversation about whether the LMC midwife will be involved in her Intrapartum care. If so, clear responsibilities should be established, for example, the LMC midwife will usually be responsible for the "normal" care with core midwife support for care of an insulin/dextrose infusion plus other secondary care input as required.
- When the woman arrives in labour, the obstetrician on call for the day is informed of her admission.
- An IV leur is inserted and CBC, group and hold, urea and electrolytes are sent to the laboratory.
- BSLs are taken hourly. The BSLs are recorded on the Blood glucose and insulin chart and in the body of the woman's notes (refer appendix 4).
- If the woman usually uses an insulin pump, this will be replaced by an insulin dextrose infusion in labour.
- Confirm there is a documented plan for insulin treatment **after** delivery, as doses will be less than pre pregnancy doses immediately after delivery. If there is no plan, ask the diabetes team/physician for advice. If this is noticed in the middle of the night, this can wait until morning, and if the woman delivers overnight, a dextrose/insulin infusion can continue until breakfast time.
- Women with Type 1 diabetes are usually treated with an insulin dextrose infusion once in active labour, unless their labour is very rapid. The endocrinologist should have put a management plan with the recommended sliding scale A, B or C into the clinical notes. The rate of the insulin infusion is titrated according to the prescribed sliding scale which is documented on the woman's medication chart. See Appendix 1: Diabetes management in labour
- If there is no management plan for the insulin dextrose infusion available, contact the diabetes nurse educators or Dr Bruce, the endocrinologist, Monday to Friday, 8-4.30pm. Outside of these hours, contact the on-call medical registrar.
- If the glucose is < 3.5 mmol/L or the woman develops symptomatic hypoglycaemia, switch off the insulin infusion and treat with glucose Vitatab tablets or dextrose gel, Hypofit, first and subsequent protein snack e.g. glass

of milk or cheese sandwich (see Appendix 3: Management of hypoglycaemia). Bear in mind, women with Type 1 diabetes may have “hypo unawareness” where they don’t feel symptoms until their blood glucose has dropped to well below 3.5.
- Continuous electronic fetal monitoring is maintained throughout the labour and birth.
- The insulin/dextrose infusion should be continued after the birth of the baby, until the woman is eating and drinking normally.

Induction of Labour

- Admission is undertaken and the woman’s insulin requirements and Intrapartum sliding scale (if required) are transcribed from the antenatal diabetic clinic notes onto the woman’s medication chart.
- The woman is asked to arrive on delivery suite at 7.30am for CTG monitoring and routine observations. She will then be reviewed by the obstetrician on call for the day.
- Intravenous cannula is inserted
- CBC, urea, electrolytes and a group and hold are taken and documented in the notes.
- The induction process will proceed as per the HVDHB Induction of labour protocol, with full discussion and consent of the woman.
- Insulin as prescribed by the endocrinologist prior to the induction on the “Diabetes management in labour plan” should be continued with meals and/or at bedtime until in active labour.
- BSLs should be taken before meals, 2 hours after meals and at bedtime. The BSLs are recorded on the diabetes record chart and in the body of the woman’s notes.
- If labour does not establish, the woman may continue eating – after consultation with the obstetric registrar.
- Once labour is established, proceed as given for spontaneous onset of labour
- Use of IV Ranitidine given 6 hourly should be considered and discussed with the obstetrician, particularly if there is an increased risk of LSCS.

Elective Caesarean Section

- The woman is admitted to Surgical Admissions as usual, but may have had a pre-admission CTG in MAU prior at the obstetrician’s request.
- Women with Type 1 diabetes should ideally be scheduled first on the theatre list.
- On the day prior to surgery the long acting basal insulin (Lantus) will have been reduced as lasts 24 hours in the system. If not the woman would be at greater risk of hypoglycaemia once nil by mouth.
- A dextrose/insulin infusion should be started before going into theatre.
- The dextrose/insulin infusion will continue until the woman is eating meals after which time subcutaneous insulin via pump or sc injection regime will be restarted.
- Women with Type 1Diabetes can eat and drink as for anyone else post caesarean section.

- Blood glucose should be checked 1 hourly (or 2 hourly overnight) postnatally while an insulin infusion is in use as blood glucose levels and insulin requirements can change quickly.
- Confirm there is a documented plan for insulin treatment **after** delivery, as doses will be less than pre pregnancy doses immediately after delivery. If there is no plan, ask the diabetes team/physician for advice.
- If steroids are required prior to elective caesarean section at less than 39 weeks, this will need to be planned in conjunction with the diabetic and obstetric team as steroids will raise blood sugars usually increasing about 8 hours after the dose and may require management using insulin. See HVDHB Protocol **Management for Diabetes in Pregnancy requiring Steroid Therapy**

Postpartum care

- Ensure there is a plan in the notes for postpartum insulin doses. Insulin requirements will drop to less than early pregnancy doses. Women will need to check their blood glucose levels frequently (before and after meals and at least once during the night) and should keep in close contact with the diabetes nurse educators in the first few weeks as insulin requirements take some time to settle down.
- Post caesarean section, while still fasting and on a dextrose/insulin infusion, the woman will need to test her blood glucose 2 hourly. Aim to keep the blood glucose between 4.0-10.0mmol/L
- If the woman is expected to be fasting for longer than 6 hours or complications arise, the insulin infusion should be continued at a rate determined by the diabetes team, in conjunction with a 5% dextrose infusion running at 100mls per hour. (Appendix 2: Insulin infusion for diabetic women in labour; preparation & procedure)
- If a woman has a blood glucose >10 mmol/L, inform the obstetric team in the first instance.
- If the blood glucose is >3.5mmol/L or the woman has symptoms of hypoglycaemia, treat as per Appendix 3: Management of hypoglycaemia.
- The diabetes nurse educator is asked to see the woman on the same day as delivery, or the next working day if that is not possible.
- Consider the effect of breastfeeding on blood glucose levels and women may find that extra snacks are necessary when feeding, especially at night-time, to avoid hypoglycaemia.

Care of the baby

- Consider having paediatric presence at birth
- Encourage skin to skin and early feed within an hour of birth.
- The infant should have a supervised breast/EBM/formula feed within the first hour, and then has his/her blood glucose checked within 1 hour of this, i.e. within 2 hours of birth.
- Heel prick blood glucose monitoring is performed pre feed 3-4 hourly until there have been 3 consecutive blood glucose recordings > 2.5mmol/L.
- Check whether the mother has expressed antenatally. Use expressed colostrum in preference if baby needs supplementary feeds. It should not be used instead of a breastfeed.

- Encourage the mother to hand express after feeds or if the baby will not or cannot breastfeed adequately.
- The neonatal hypoglycaemia –prevention and management of – protocol is observed if the infant's BSL is < 2.6mmol/L (inform paediatric SHO on call).

Contraception

No contraceptive method is specifically contraindicated in women with diabetes thus selection should be based upon the same guidelines that apply to all women.

Postpartum Follow-up

Women with Type 1 diabetes will be given an appointment at the Antenatal Diabetes Clinic usually within 4 weeks of delivery. HbA1c and other blood tests may be ordered by the endocrinologist.

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Appendices

1. Diabetes management in labour – management plan for insulin
2. Insulin infusion for diabetic women in labour; preparation & procedure
3. Management of hypoglycaemia
4. Blood glucose and insulin chart

Appendix 1: Diabetes management in labour- management plan for insulin

Management plan for:
For planned induction take usual diet and / or insulin the night before. On the morning of induction if taking insulin give only half the usual dose along with a light breakfast.

When labour is established monitor glucose 1 – 2 hourly. Aim to keep blood sugar in the 3.6 – 7.5 range. Commence IV insulin sliding scale if glucose is 7.0mmol/L or more on two occasions 30 minutes apart.

Start with **Protocol A B C**
If no response in 2 hours change to a higher dose protocol, (i.e. B or C).

Insulin Infusion (Intravenous regular insulin)

- Give insulin via syringe drive or IV pump 50 units in 50ml Normal saline, i.e. 1 unit / ml
- Give IV fluids 5% dextrose 100ml / hour

Protocol	**A**	**B**	**C**
Glucose (mmol/L)	**IV regular insulin units / hr**		
0 – 3.5	0	0*	0*
3.6 – 5.5	0.5	1	1
5.6 - 8.0	1	2	3
8.1 – 10	2	3	5
10.1 – 14	3	5	8
>14	5	8	12

- *Stop the infusion for 30 minutes, treat hypoglycaemia with 10ml 50% dextrose IV, repeated as necessary. After 30 minutes retest glucose infusion at appropriate setting.
- Stop the insulin infusion at the time of delivery. Measure blood glucose approximately 4 hourly postpartum (when awake) for 24 hours. In general, extra insulin will not be required and would only be given if glucose stays above 12.0 mmol/L.
- Make an appointment at the combined obstetric and antenatal diabetes clinic 6 weeks postpartum with a fasting blood glucose to be taken 6 days prior.

Appendix 2: Insulin infusion for gestational diabetic women in labour

Preparation

Prior to the insulin infusion being commenced maternal blood is taken for:

- Random glucose
- Urea & electrolytes
- Full blood count
- Group and hold

Equipment required

- 1 vial of Actrapid insulin
- 50ml of IV normal saline 0.9%
- Alaris infusion pump
- Connection tubing
- 1 x 50ml syringe
- 1 insulin syringe
- 1000ml of 5% dextrose

Note: The preparation of an insulin infusion must be double checked with another midwife prior to being connected to the woman.

Procedure

- Using the insulin syringe draw up 50 units of Actrapid insulin.
- Add the 50 units of Actrapid to the empty 50ml syringe
- Draw up the normal saline in the same syringe that the Actrapid has been transferred into. Sufficient normal saline is drawn up to ensure that the 50 units of Actrapid are added to 50mls of normal saline (concentration of 1 unit per ml).
- To minimise insulin absorption to IV tubing, it is advisable to flush with 20mls of the diluted insulin infusion solution wherever new IV tubing is used. Ensure not connected to women when priming.
- A Y extension luer lock with back check valves is then connected to the woman's IV leur so that both lines can be connected to it.
- A 5% dextrose mainline is commenced at 80mls per hour using an electronic pump.
- The 50ml syringe containing the Actrapid infusion is inserted into an Alaris infusion pump and connected to the 5% dextrose mainline.
- The rate of the insulin infusion is titrated according to the prescribed sliding scale that is documented on the woman's medication chart.

If a Syntocinon infusion is also required a second IV cannula must be inserted.

Hourly BSLs are obtained by finger prick. Care must be taken not to take the BSL from the hand which has the 5% dextrose infusing into it.
The BSLs are recorded on the diabetes record chart and in the body of the woman's notes.

Recordings required

- Hourly BSLs
- A partogram is commenced once labour is established

- Continuous EFM is maintained during the labour and birth
- Strict fluid balance and record keeping are required.

Appendix 3: Management of hypoglycaemia

BSL of less than 4 mmol/L

Hypoglycaemia is a BSL outside the lower limit of the woman's target range, typically less than 4.0mmol/L that may or may not be associated with symptoms such as paleness, sweating, hunger or nausea, trembling and palpitations, irritability, a personality change, drowsiness, fitting or coma.

Pre-packaged hypoglycaemia treatment kit

Pre-packaged hypoglycaemic treatment kits for oral treatment of the conscious patient are available in all wards. Each kit consists of a white plastic container containing La Vita tablets, hypofit sachets and jellybeans. Written instructions for using the hypoglycaemic treatment kit are enclosed in the kit.

If the woman is conscious and not nil by mouth

Hypoglycaemia is defined as a blood sugar level below 4 mmol/L. It should be treated immediately at the onset of symptoms or if the BSL is less than 4 mmol/L without symptoms. (**NB**: women with longstanding diabetes may have no symptoms despite being hypoglycaemic).

Check the BSL first. If it is less than 4 mmol/L or the woman is symptomatic – follow the three-step treatment:

1. Give a simple carbohydrate:
    - 3 - 4 Vita tabs or
    - 2 – 3 teaspoons sugar in water or
    - 100ml sweet drink / fruit juice
2. Recheck BSL after 5 – 10 minutes and repeat the above prn.
3. Once the BSL is greater than 4 mmol/L give complex carbohydrate:
    - 1 sandwich or
    - 3 crackers and cheese or
    - 3 plain biscuits with a glass of milk

Recheck the BSL after 20 minutes. The diabetic team should be informed the next working day so that appropriate alterations to the woman's diabetes therapy can be made.

Do not withhold subsequent diabetes tablets or insulin but consider reducing the dose (if insulin is withheld, hyperglycaemia will inevitably ensue and in particular, women with Type 1 diabetes can rapidly develop a potentially life threatening diabetic ketoacidosis within a few hours).
The BSL should ideally be greater than 4 mmol/L during the daytime and greater than 6-7 mmol/L overnight. If the BSL is still below 4 mmol/L after giving the glucose solution 3 times, summon the Obstetric SHO / Registrar for medical assistance. The Diabetes team should also be informed the next working day so that appropriate alterations to the woman's diabetes therapy can be made.

- Ascertain cause of hypoglycaemia if possible
- Adjust diabetes tablet or insulin dose, diet, activity as appropriate

- Test the woman's BSL according to the advice of the specialist, registrar or diabetes nurse clinician.
- Ensure that the woman can manage her usual diet.

Note: Review current knowledge, provide further management and education as necessary or refer to inpatient diabetes nurse.

If the woman is unconscious or nil by mouth

Do not attempt to administer food or liquids due to risk of aspiration to the lung.

Place the woman in the recovery position. Summon the Obstetric SHO or Registrar for immediate assistance. An intravenous cannula must be inserted immediately (if not already present).

1. Administer:
   IV Dextrose
   - 100mls of 10% dextrose intravenously as a slow push or
   - 50mls of 20% dextrose intravenously.

   If no intravenous cannula, give IM Glucagon 1mg. If no response within 10 minutes of administration the glucagon can be repeated. If still no response insert an IV line.

2. Recheck BSL after 5 – 10 minutes and repeat the above prn

3. Once >4.0mmol/L and the woman is sufficiently conscious to swallow, give complex carbohydrate food and monitor blood glucose as for conscious woman.

4. If the woman is to remain nil by mouth, IV therapy must be commenced as soon as possible:

   - IV fluid with 6 – 10gm dextrose per hour

Appendix 4: Blood Glucose and Insulin Chart for Ante and Post natal monitoring

Date	BSL							Oral Hypoglycaemia
	Ketones							
	Medication Dose							Insulin
Time								Type Of Medication
Date	BSL							Oral Hypoglycaemia
	Ketones							
	Medication Dose							Insulin
Time								Type Of Medication
Date	BSL							Oral Hypoglycaemia
	Ketones							
	Medication Dose							Insulin
Time								Type Of Medication
Date	BSL							Oral Hypoglycaemia
	Ketones							
	Medication Dose							Insulin
Time								Type Of Medication
Date	BSL							Oral Hypoglycaemia
	Ketones							
	Medication Dose							Insulin
Time								Type Of Medication
Date	BSL							Oral Hypoglycaemia
	Ketones							
	Medication Dose							Insulin

Informed Consent

The right of a consumer to make an informed choice and give informed consent, including the right to refuse medical treatment, is enshrined in law and in the Code of Health and Disability Consumers' Rights in New Zealand. This means that a woman can choose to decline treatment, referral to another practitioner, or transfer of clinical responsibility. If this occurs follow the process map on page 18 of the Referral Guidelines (Ministry of Health, 2012).