

GUIDELINE: **Diabetes in Pregnancy - Intrapartum care**

AUTHOR: Diabetes in Pregnancy Working Group.

SCOPE: Obstetricians, midwives, and nurses working in the maternity unit.

PURPOSE:

The purpose of this document is to provide all clinical staff and Lead Maternity Carers (LMC'S) with the necessary information required for the care of women on the maternity unit with diabetes in pregnancy.

OVERVIEW:

Pregnancy complicated by diabetes, be it Type 1 diabetes, Type 2 diabetes, or gestational diabetes mellitus (GDM), poses extra risk to the mother and her developing baby. Maternal hypoglycaemia poses a risk to the woman; maternal hyperglycaemia poses a threat to both the mother and the developing fetus.

Good glucose control can reduce the rates of macrosomia, serious maternal and infant outcomes such as death, shoulder dystocia, birth trauma, respiratory distress and-neonatal hypoglycaemia. Good glucose control can lead to a healthier quality of life for both mother and baby.

All practitioners must be alert to the possibility of Diabetic Ketoacidosis (DKA). In type 1 diabetes DKA is **a medical emergency. (Call O&G immediately and if necessary 777)**. Women presenting with symptoms such as fever, diarrhoea, vomiting and infection or have a poor compliance are at risk. In this situation, attention to blood glucose control, hydration, ketonuria and ketoaemia is vital.

Intensive surveillance and optimal management by a multidisciplinary health team, in partnership with the woman and her family, is crucial in obtaining the best obstetric results in pregnant women with diabetes.

CONTENT:

[PROTOCOL A - GESTATIONAL DIABETES MELLITUS- not requiring insulin therapy, care in labour](#) Page 3

[PROTOCOL B - DIABETICS REQUIRING INSULIN THERAPY – care in labour](#) Page 4

DEFINITIONS:

GESTATIONAL DIABETES MELLITUS (GDM)

GDM is defined as “any degree of glucose intolerance with onset or first recognition during pregnancy”. The definition applies whether or not insulin is used for treatment or hyperglycaemia persists after pregnancy. It does not exclude the possibility that unrecognised glucose intolerance may have predated the pregnancy.

GDM occurs in 1 to 14 percent of all pregnancies, depending on the population and diagnostic criteria used. It is associated with significant risk of maternal and perinatal complications.

GDM is more likely to be present if there is a history of:-

- Obesity
- Previous large babies
- Previous GDM
- Previous unexplained perinatal loss, miscarriage and premature deliveries.

Glucose tolerance often returns to normal after birth, but there is a high risk of subsequently developing type 2 diabetes (up to at least 50 percent).

TYPE 1 DIABETES

Type 1 diabetes is of auto-immune or viral aetiology with other environmental and genetic factors involved. Incidence of type 1 diabetes peaks in childhood and in the elderly. It usually presents acutely. Islet cell antibodies, islet tyrosine phosphatase 2 (IA2) antibodies and/or glutamic acid decarboxylase (GAD) antibodies are often present. Individuals with type 1 diabetes cannot produce adequate insulin levels and consequently are dependent upon insulin injections to control their blood sugar. If their blood sugars are not controlled they are at risk for coma and death.

TYPE 2 DIABETES

The cause of type 2 diabetes remains unknown although an inherited predisposition and lifestyle factors such as obesity contribute. It is more common for members of families with a history of diabetes. However, it is less likely among those of European descent. There is a general increase in the prevalence of **Type 2 diabetes worldwide. Type 2 diabetes is associated with significant morbidity and mortality.** The goal of treatment is to prevent long term complications and symptoms of diabetes. Women with type 2 diabetes are frequently first diagnosed with this condition during pregnancy. It can be difficult to differentiate between gestational diabetes and previously undiagnosed type 2 diabetes. A definitive diagnosis can only be made after delivery.

Women with type 2 diabetes may be able to control their blood sugars with diet alone but most will also need oral medications and/or insulin. The pancreas produces insulin however the cells are resistant to the action of insulin. Consequently they often need oral medications to sensitize them to insulin, such as Metformin or Glibenclamide, or insulin itself. They rarely suffer from DKA though it is not impossible.

PROTOCOL A

GESTATIONAL DIABETES MELLITUS - not requiring any medication Care in labour.

PURPOSE: For women with Gestational Diabetes who are controlled with diet only

CARE IN LABOUR

Labour should be managed as directed by the Obstetrician and documented in the MCIS “management plan” and in accordance with this guideline. If there is no care plan documented follow this guideline.

A baseline sugar level (BSL) reading should be taken with the glucometer Optium Neo H. **BSL’s should be taken and recorded every two hours in early labour and one hour in active labour unless otherwise requested by the Obstetrician or the DNS.**

Continue diabetic diet as tolerated and if IV fluids are required use Normal Saline.

Maternal Blood Glucose Monitoring

The aim is to keep the maternal blood glucose levels at 4.0 – 7.0 mmol/L throughout labour and birth to optimise the well-being of the infant at birth. Record all results in the MCIS.

Any blood glucose level above 7.0 mmol/L should be discussed with on call O&G to confirm if a further laboratory test is needed (call on call T-Lab if out of hours). Repeat the blood test after one hour with the Optium Neo H glucometer or t- lab if result still exceeds 7.0 mmol/L notify the on call Obstetrician immediately and commence **Protocol B.**

PROTOCOL B

DIABETICS – requiring medication Care in labour

PURPOSE: For women with pre-existing diabetes or diabetes requiring medication

CLINICAL RESPONSIBILITY:

Pre-existing diabetics are a level 3 section 88 referral-the LMC must recommend to the woman that the responsibility for her care be transferred to a specialist. The responsibility for midwifery care will be negotiated among the woman, the LMC, the specialist obstetrician and the core midwifery team. If appropriate there may be a transfer of midwifery care to the core midwifery staff.

CARE IN LABOUR

Labour should be managed as directed by the Obstetrician and follow the woman's risk management plan on Maternity Clinical Information System (MCIS) or this guideline.

A baseline sugar level (BSL) reading should be taken with the glucometer Optium Neo H. **BSL's should be taken and recorded every two hours in early labour and one hour in active labour unless otherwise requested by the Obstetrician or the DNS.**

Continue diabetic diet as tolerated and if IV fluids are required use Normal Saline.

Maternal Blood Glucose Monitoring

The aim is to keep the maternal blood glucose levels at 4.0 – 7.0 mmol/L throughout labour and delivery to optimise the well-being of the infant at birth. Record all results in the Maternity Computer Information System (MCIS).

Any blood glucose level above 7.0 mmol/L should be discussed with on call O&G to confirm if a further laboratory test is needed (call on call T-Lab if out of hours). Repeat the blood test after one hour with the Optium Neo H glucometer or t- lab if result still exceeds 7.0 mmol/L notify the on call Obstetrician immediately for further instruction.

Once established in labour, the woman should be nil by mouth except for water only as tolerated unless otherwise directed.

IV THERAPY IN LABOUR

- Once labour has established, insert an IV Luer (minimum 18 gauge).
- Take a blood glucose reading
- Prepare as a 'mainline' – Normal Saline 1000ml and infuse using the Baxter pump at a rate of 125ml/hr minimum
- Prepare dextrose 10% to piggyback into the Normal Saline and administer via a Baxter pump following **Management Table for Protocol B.**

INSULIN INFUSION

- Discontinue the use of subcutaneous injections or portable insulin pump when established in labour
- Piggyback the following infusion into IV therapy mainline:

- Use 10 International Units (IU) of NOVARAPID in 100 Millilitres (mls) of normal saline(i.e., 1 international unit in 10 mls)
- Run at a rate according to the **Management Table for Protocol B.**

MANAGEMENT TABLE FOR PROTOCOL B

Blood Glucose Levels (mmol/L)	Infusion Rate Dextrose 10% (ml/hr)	Dextrose 10% Bolus (mls)	Frequency Of blood Glucose tests	Insulin Infusion Rate (ml/hr)	Comments
3.0 mmol/L Or less	50	100	10 minutes until over 4 mmol/L	Nil	Notify OB. Send blood glucose to lab
3.1-3.5	50	50	10 minutes until over 4 mmol/L	Nil	Notify OB
3.6-3.9	50	Nil	10 minutes until over 4 mmol/L	Nil	Notify OB
4.0-5.0	50	Nil	60 minutes	5 ml/hr	Maintenance dose
5.1-6.0	50	Nil	60 minutes	10 ml/hr	Maintenance dose
6.1-7.0	50	Nil	60 minutes	20 ml/hr	Maintenance dose
7.1-8.0	50	Nil	30 minutes	30 ml/hr	Start infusion if not already in progress
8.1-10.0	Nil	Nil	15 minutes	40 ml/hr	Notify OB
Above 10.0	Nil	Nil	15 minutes	50 ml/hr	Notify OB. Send blood glucose to lab

The aim is to keep the blood glucose levels at 4.0 -7.0 mmol/L throughout labour and delivery to optimise the wellbeing of the infant at delivery.

Blood glucose levels should be tested hourly by glucometer (Optium Neo H) and follow the **Management Table for Protocol B as above. This protocol is mostly designed for women with Type 1 diabetes, in active labour who are nil by mouth. It is a guideline and will need to be individualized.** A triple Baxter pump may be needed. If extra fluids are required, a **separate IV line** will be necessary.

Urine test for ketones

Encourage women to pass urine 2-3 hourly and test for ketones.

- If ketones found to be moderate/large on more than 2 consecutive occasions, report to the obstetrician regarding appropriate management.

REFERENCES:

Ministry of Health. 2014. Screening, Diagnosis and Management of Gestational Diabetes in New Zealand: A Practice Guideline. Wellington: Ministry of Health
Acknowledgements to Waikato District Health Board Diabetes Guidelines (2012)
Acknowledgements to Auckland Women’s Hospital Diabetes Guidelines (2013)
Acknowledgements to Counties Manukau for discussion and guidance (2015)

ASSOCIATED DOCUMENTS:

Hauora Tairāwhiti
Use of glucometer Optium Neo H (operators Manual)
Medicines Management Policy - Hauora Tairāwhiti
Maternity Diabetes in Pregnancy Resource File

Diabetes Ante-natal Blood Glucose Monitoring.pdf
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Diabetes in Pregnancy Intrapartum Care.pdf
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Diabetes Insulin Therapy in Gestational Diabetes.pdf
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Diabetes Maternal Postnatal Management.pdf
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Diabetes Nutritional Management of Diabetes in Pregnancy.pdf
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EVALUATION METHOD:

Compliance with this guideline will be evaluated by audit.

Authorised By:
(HOD Obstetrics)

Authorised By:
(Clinical Care Manager, Woman, Child & Youth)

Date of Approval: December 2019

Next Review Date: December 2022