

TYPE 2 DIABETES MELLITIS (INSULIN AND/OR METFORMIN) – ANTENATAL, INTRAPARTUM AND POSTNATAL CARE

DEFINITION

Type 2 Diabetes is characterised by insulin resistance and relative impairment of insulin secretion leading to hyperglycaemia.

ANTENATAL CARE – BETAMETHASONE ADMINISTRATION

REFER TO: [Insulin Infusion following Betamethasone Injections for Women with Diabetes in Pregnancy](#) (C260117, Ref.6466)

MANAGEMENT FOR ALL ADMISSIONS

- Inform the Associate Charge Midwife Manager, Obstetric Team and Neonatal Registrar of the woman's diabetic status.
- Ensure all current medications, including Insulin is charted on MedChart.
- Commence documenting blood glucose levels on the Antenatal Diabetes and Treatment Testing Form (Ref.8566) or Diabetes Testing and Treatment Form (Ref.2219).

The form is titled 'Antenatal Diabetes Testing & Treatment'. It includes a header with Canterbury District Health Board contact information. Below the header is a patient information section with fields for name, date of birth, and medical history. The main body of the form is a grid for recording blood glucose levels. The grid has columns for 'DATE' and 'TIME', and rows for 'Fasting' and 'Postprandial (2 hours post-meal)'. A vertical green bar on the right side of the grid is labeled 'ANTENATAL DIABETES TESTING & TREATMENT'. The form is dated September 2011.

Antenatal use (Ref.8566)

The form is titled 'ADULT - DIABETES TESTING AND TREATMENT'. It includes a header with Canterbury District Health Board contact information. Below the header is a patient information section. The main body of the form is a grid for recording blood glucose levels. The grid has columns for 'DATE' and 'TIME', and rows for 'Fasting', 'Postprandial (2 hours post-meal)', and 'Pre-prandial (before meals)'. A vertical green bar on the right side of the grid is labeled 'DIABETES TESTING & TREATMENT'. The form is dated August 2017.

Intrapartum and postnatal use (Ref.2219)

It is important that despite self-monitoring and/or self-medicating, that all blood glucose levels and insulin doses are documented.

- Perform admission CTG as there is an increased risk of fetal hypoxia during labour.

NOTE

For women taking Insulin glargine (Lantus®) or detemir (Levemir®) halve the dose:

- a) If in spontaneous labour
- b) On the day of an induction of labour until birthed
- c) The evening prior to an elective caesarean section

ELECTIVE CAESAREAN SECTION

(see [Appendix A](#))

NOTE

Women should be placed first on the theatre list.

- The normal evening insulin and/or metformin dose is given on the day prior to the elective caesarean section except for women on glargine (Lantus®) or detemir (Levemir®) where the dose should be halved the evening before.
- Withhold morning insulin and/or metformin on the day the woman is undergoing the elective caesarean section.
- Establish intravenous access and avoid giving glucose containing intravenous fluids except for Plasma-Lyte 148 + 5% glucose (obtain from supply not pharmacy).
- Monitor capillary blood glucose levels before surgery and then hourly and document on the Diabetes Testing and Treatment Form (Ref.2219).
- If capillary blood glucose < 4 mmol/L or > 7 mmol/L commence intravenous Insulin / Plasma-Lyte 148 + 5% glucose infusion with hourly blood glucose monitoring (see [Appendix C](#)).

INDUCTION OF LABOUR (IOL) OR SPONTANEOUS LABOUR

(see [Appendix B](#))

PRIOR TO LABOUR ESTABLISHING

- Continue usual insulin regime and/or metformin with meals until labour is established.
For women taking insulin, glargine (Lantus®) or detemir (Levemir®) halve the dose on the day of the induction of labour and until birthed.
- Continue to monitor blood glucose levels and document on Antenatal Diabetes and Treatment Testing Form (Ref.8566).

ONCE LABOUR IS ESTABLISHED

- Discontinue subcutaneous insulin and/or metformin.
- The woman may eat – in this instance may require a small dose of subcutaneous insulin in consultation with the physician.
- Women may only drink water.
- Establish intravenous access. Take bloods for group and hold and CBC.
- Avoid dextrose containing intravenous fluids unless requiring infusions as below.
- Monitor capillary blood glucose levels hourly and document on the Diabetes Testing and Treatment Form (Ref.2219).
- If capillary blood glucose:
 - < 4 mmol/L – in a conscious patient this can be managed initially with Hypo-Fit (18 g carbohydrate). Give one sachet if weight < 90 kg or two sachets if weight ≥ 90 kg. Check capillary blood glucose after 10 minutes and repeat Hypo-fit treatment if required. If no response after 30 minutes commence intravenous Plasma-Lyte 148 + 5% glucose infusion with hourly blood glucose monitoring (see [Appendix C](#)). Cease infusion when capillary blood glucose reading is above 5mmol/L and recheck capillary blood glucose at hourly intervals.
 - > 7 mmol/L commence intravenous Insulin/Plasma-Lyte 148 + 5% glucose infusion with hourly blood glucose monitoring (see [Appendix C](#)).
- Continuous electronic fetal monitoring (EFM).

POSTNATAL MANAGEMENT

FOR WOMEN ON AN INSULIN INFUSION

- Insulin requirements fall rapidly
 - The insulin infusion rate is halved immediately following birth (postpartum rate).
 - The Plasma-Lyte 148 + 5% glucose infusion remains unchanged.
- If the patient has blood glucose levels > 7 mmol/L after two consecutive readings, then double the infusion rate, i.e. return to the sliding scale for insulin used prior to birth (see [Appendix C](#)).
- If < 3.5 mmol/L, stop the insulin infusion and check capillary blood glucose level every 15 minutes until > 4mmol/L and hourly thereafter until eating and remain off insulin infusion.
- The insulin infusion is continued until the woman is ready to eat.
- The woman may be transferred to the postnatal ward after ceasing the insulin/Plasma-Lyte 148 + 5% glucose infusion.
- Contact the on-call physician if problems arise.

NOTE

Daily monitoring of electrolytes is required for infusions extending beyond 24 hours (risk of hyponatraemia and hypokalaemia).

Insulin infusions must be replaced every 24 hours.

For women **NOT** on an insulin infusion

- Monitor blood glucose 2 hourly and document on the Diabetes Testing and Treatment Form (Ref.2219).
- Once ready to eat, continue diabetic diet and monitor blood glucose before and after all meals.

FOR ALL WOMEN WITH TYPE 2 DIABETES

- Once eating, monitor blood glucose before and one hour after meals.
- Women on diet alone **before** pregnancy may not require additional treatment.
- Women taking metformin **before** pregnancy can recommence this day 2 postpartum.
- Women taking insulin **before** pregnancy will need consultation with the physician as insulin requirements vary in the immediate postpartum period.

REFERENCES

1. McLaughlin C and McCance DR: Diabetic management in labor delivery and post-delivery. In A Practical Manual of Diabetes in Pregnancy Editors McCance DR, Maresh M and Sacks DA; Wiley-Blackwell 2010
2. National Institute for Health and Care Excellence (NICE) guideline (2011): CG63 Diabetes in pregnancy <http://www.nice.org.uk/nicemedia/live/11946/41320/41320.pdf>

Date Issued: February 2020

Review Date: February 2023

Written/Authorised by: Maternity Guidelines Group

Review Team: Maternity Guidelines Group

Type 2 Diabetes Mellitus (Insulin and/or Metformin)

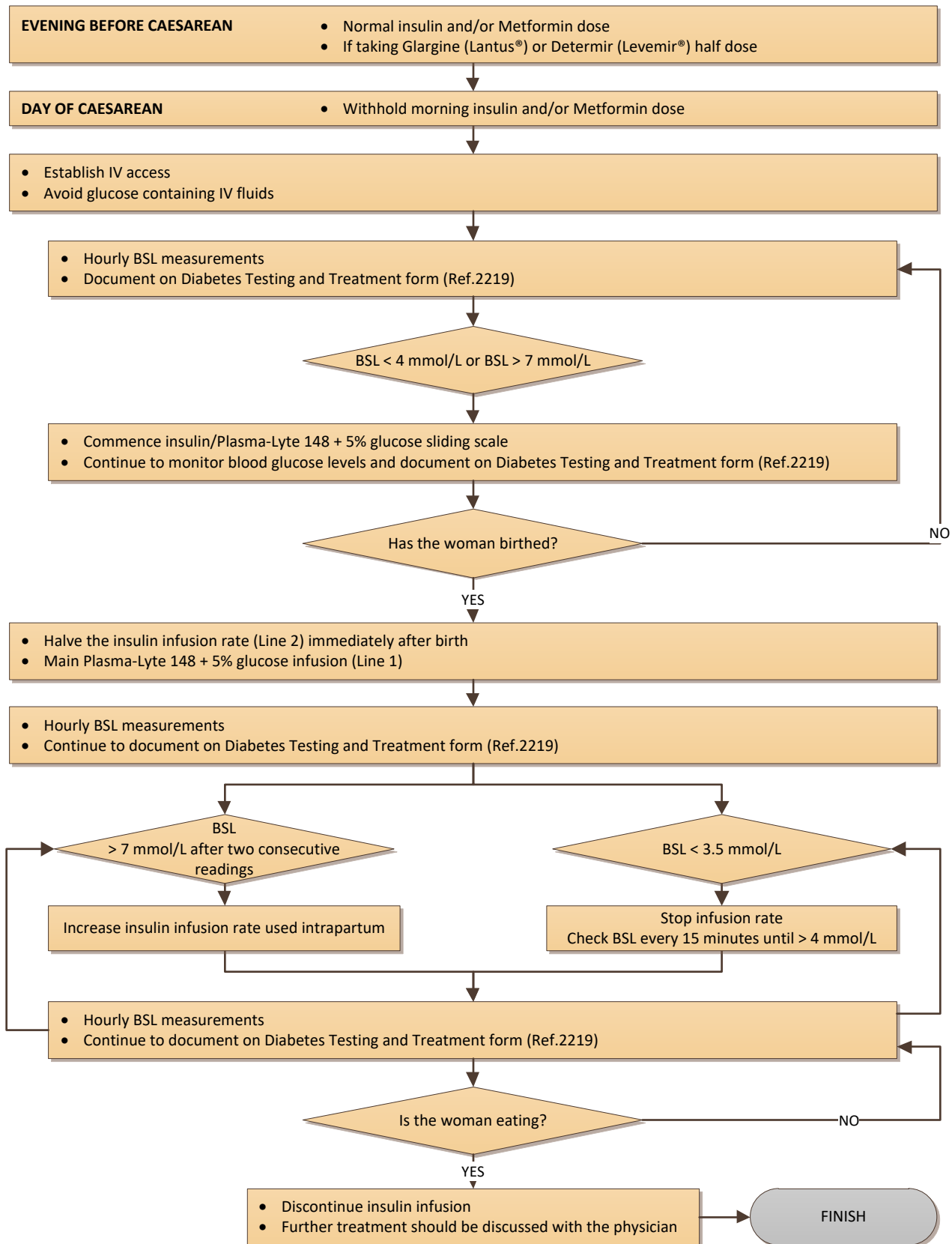
– Antenatal, Intrapartum and Postnatal Care

Maternity Guidelines

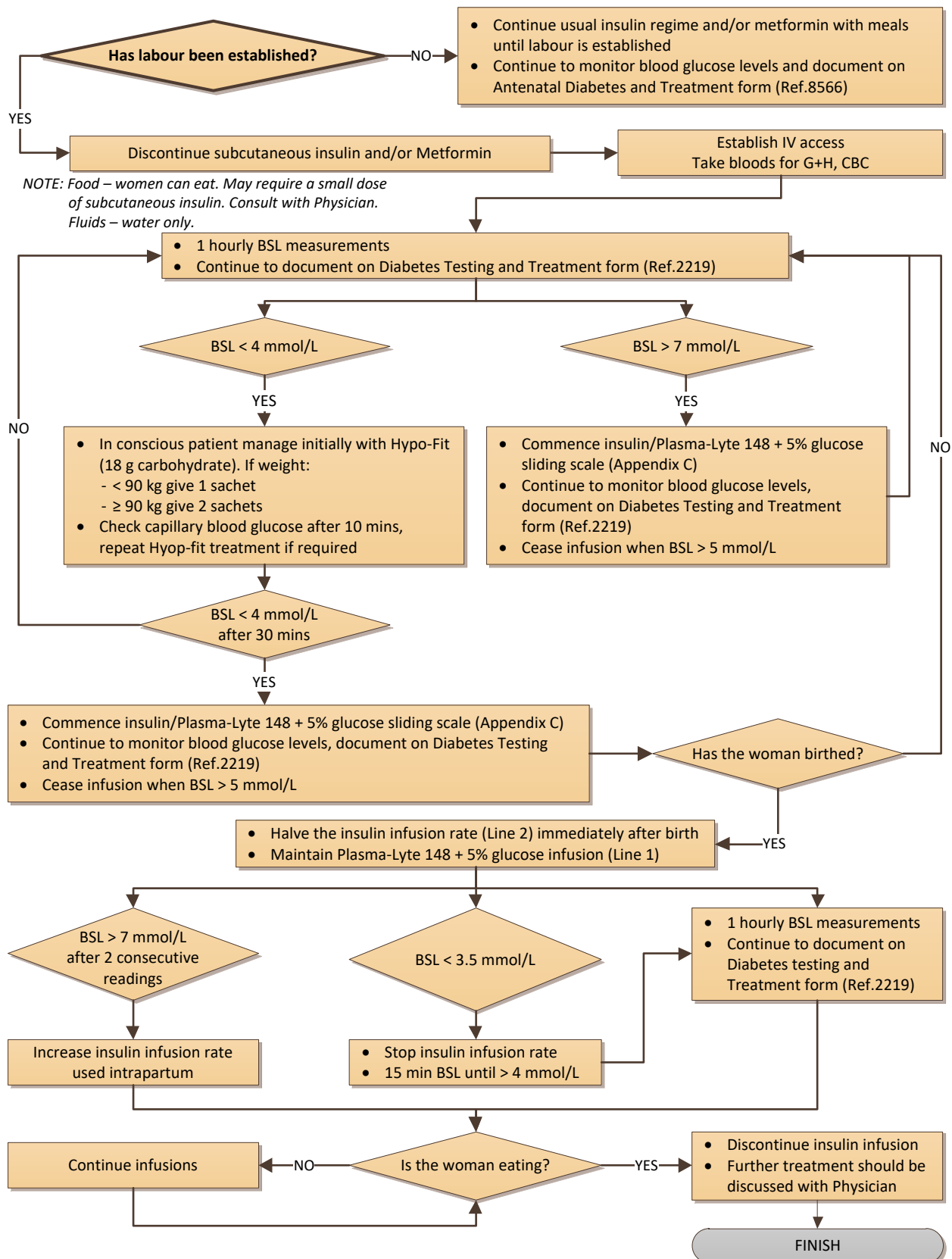
Christchurch Women's Hospital

Christchurch New Zealand

APPENDIX A TYPE 2 DIABETES MELLITUS – ELECTIVE CAESAREAN SECTION INTRAPARTUM AND POSTNATAL MANAGEMENT



APPENDIX B TYPE 2 DIABETES MELLITUS - INDUCTION OF LABOUR/ SPONTANEOUS LABOUR AND POSTNATAL MANAGEMENT



APPENDIX C INSULIN/PLASMA-LYTE 148 + 5% GLUCOSE SLIDING SCALE**INSULIN/PLASMA-LYTE 148 + 5% GLUCOSE SLIDING SCALE**

- Two intravenous lines are to be sited. One for Insulin/Plasma-Lyte 148 + 5% glucose and one for oxytocin/anaesthetic/analgesic requirements.
- No glucose containing infusions, other than the fixed rate of Plasma-Lyte 148 + 5% glucose, should be administered.
- The intravenous line for the Plasma-Lyte 148 + 5% glucose/insulin should be kept patent with a small amount of saline while the infusions are prepared.

Prepare the prescribed Insulin / Plasma-Lyte 148 + 5% glucose infusion as follows:

- The Plasma-Lyte 148 + 5% glucose is mainlined to the woman with the insulin infusion attached to the mainline via Y-site.
 - Plasma-Lyte 148 + 5% glucose – mainline
 - Run one litre of Plasma-Lyte 148 + 5% glucose at a rate of 125 mLs per hour via an infusion pump. DO NOT ALTER.
 - Insulin via Y-site on main line
 - Add 100 units Actrapid insulin using an insulin syringe to 100 mLs Saline and run via an Alaris infusion pump.
 - Run 10 mLs through the tubing before attaching the tubing to the mainline via the Y-site. This will prime the tubing and minimise subsequent binding of insulin to the plastic of the giving set.
 - The insulin is drawn up as directed by the Fluid and Medication Management Manual Volume 12 and checked by two midwives (one of whom must be intravenous certificated).
 - Run according to the Blood Glucose/Sliding Scale of Insulin Prior to Birth.
- Blood glucose should be checked immediately prior to starting the infusions and then hourly until the surgeon has directed the woman is ready to eat.
 - Document blood glucose level on the Diabetes Testing and Treatment form (Ref.2219) and fluid input on the Fluid Balance 24-Hour Sheet (Ref.887).

Capillary Blood Glucose Level (mmol/L)	Infusion rate in mLs per hour (= units of Actrapid insulin per hour)
< 3.5	No insulin Increase the rate of Plasma-Lyte 148 + 5% glucose to 125 mLs/hour Check BSL every 15 minutes Call physician for advice
3.5 – 5.0	0.5
5.1 – 7.0	1
7.1 – 9.0	2
9.1 – 11.0	3
11.1 – 13.0	4
13.1 -15.0	5 Stop the Plasma-Lyte 148 + 5% glucose
> 15.0	6 Stop the Plasma-Lyte 148 + 5% glucose Call physician for advice