

TYPE 1 DIABETES MELLITIS

CARE OF WOMEN IN BIRTHING SUITE

DEFINITION

Type 1 Diabetes: described as a total lack of insulin produced by the pancreas for the requirements of the tissues. If left untreated, this can result in high blood sugars, polyuria, dehydration, and ketogenesis (ketone bodies produced from fatty acid breakdown).

INTRAPARTUM CARE

- Perform admission CTG as there is an increased risk of fetal hypoxia during labour.
- Inform the Birthing Suite Clinical Coordinator, Obstetric Team and Neonatal Registrar of the woman's diabetic status.

FOR CAESAREAN SECTION (ELECTIVE)

Women should be placed first on list.

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 hourly.

- For women on intermediate acting bedtime insulin (Humulin NPH or Protaphane):
 - The normal dose is given the night before the elective caesarean section.
 - Withhold morning insulin on the day of the elective caesarean section.
 - If capillary blood glucose < 4 mmol/L or > 7 mmol/L commence intravenous insulin/Plasma-Lyte 148 + 5% glucose infusion prior to surgery with hourly blood glucose monitoring (see Appendix A).
- For women on long-acting bedtime insulin with glargine (Lantus) or detemir (Levemir):
 - The dose should be halved the night before the elective caesarean section.
 - If blood sugar is < 4 mmol/L, commence Plasma-Lyte 148 + 5% glucose infusion at 125 mL/hr via intravenous infusion pump until blood glucose 6 mmol/L. Discontinue infusion and then monitor blood glucose hourly.
 - If capillary blood glucose > 7 mmol/L commence intravenous insulin / Plasma-Lyte 148 + 5% glucose infusion prior to surgery with hourly blood glucose monitoring (see Appendix A).
- For women who have a personal insulin pump, discuss with physician.

FOR INDUCTION OF LABOUR (IOL) OR SPONTANEOUS LABOUR (SEE APPENDIX B)

For women on glargine (Lantus) or detemir (Levemir)

- The dose should be halved the evening before IOL or expected birth

PRIOR TO LABOUR ESTABLISHING

- Continue usual insulin regime with meals until labour is established.

ONCE LABOUR IS ESTABLISHED

- If the woman has a personal insulin pump, halve the basal infusion rate
- Women may only drink water.
- Establish intravenous access. Take bloods for group and hold and CBC.
- Avoid giving glucose containing intravenous fluids unless requiring infusions as below.
- Monitor capillary blood glucose level hourly
- If capillary blood glucose:
 - < 4 mmol/L commence intravenous Plasma-Lyte 148 + 5% glucose infusion with hourly blood glucose monitoring (see Appendix A).
 - > 7 mmol/L commence intravenous insulin / Plasma-Lyte 148 + 5% glucose infusion with hourly blood glucose monitoring (see Appendix A).
- Continuous electronic fetal monitoring (EFM).

FOLLOWING BIRTH

- Insulin requirements fall rapidly.
 - The insulin infusion rate is halved immediately following birth (postpartum rate).
 - The Plasma-Lyte 148 + 5% glucose infusion rate remains unchanged.
- If the woman has blood glucose levels > 7 mmol/L after two consecutive readings, then double the insulin infusion rate, ie. return to the sliding scale for insulin as used prior to birth (see Appendix A and B).
- If blood glucose level \leq 3.5 mmol/L, stop the insulin infusion (continue Plasma-Lyte 148 + 5% glucose increasing the rate to 125 mL/hour) and check capillary blood glucose every 15 minutes until > 4 mmol/L and hourly thereafter. Restart insulin infusion at postpartum rate once blood glucose > 5 mmol/L.
- For women taking glargine insulin (Lantus), this insulin is long-acting and if the full dose was given within 24 hours of the birth (rather than the 50% dose reduction that is recommended) then hypoglycaemia can be problematic for some hours after the birth. If blood glucose level \leq 3.5 mmol/L, stop the insulin infusion (continue Plasma-Lyte 148 + 5% glucose increasing the rate to 125 mL/hour) and check capillary blood glucose every 15 minutes until > 4 mmol/L and hourly thereafter. Hypo-fit may also be required, administer 2 sachets of Hypo-Fit (36g carbohydrate), this is expected to raise the maternal blood glucose level by 2-3 mmol/l over 10 minutes, the response is dependent on maternal weight. Administer a further 1 sachet of Hypo-fit after 10-15

minutes if required. Restart insulin infusion at postpartum rate once the blood glucose is > 7 mmol/L, or if the mother is going to eat then she can administer her usual short acting insulin at her **pre-pregnancy dose less 30%**.

- NB: intravenous insulin solutions need to be replaced every 24 hours.
- Daily monitoring of electrolytes is required for infusions extending beyond 24 hours (risk of hypokalaemia and hyponatraemia).
- The infusion is continued until the woman is ready to eat.
 - A one-hour overlap is required between giving the subcutaneous insulin and stopping the intravenous insulin / Plasma-Lyte 148 + 5% glucose infusion.
 - Short acting pre-meal insulin can be commenced at the **pre-pregnancy dose less 30%**.
 - Depending on the time the infusion is stopped and when the woman had her last dose of intermediate or long acting insulin a small dose of intermediate acting insulin (Humulin NPH or Protaphane) or long acting insulin (glargine) may also be required in consultation with the physician (the dose is usually approximates the **pre-pregnancy dose less 30% in the first 24 hours after the birth**)
 - The woman may be transferred to the postnatal ward after ceasing the Plasma-Lyte 148 + 5% glucose/insulin infusion. For women on a personal insulin pump consult a physician regarding insulin dosage
- Contact on-call Physician if problems arise.

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>

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

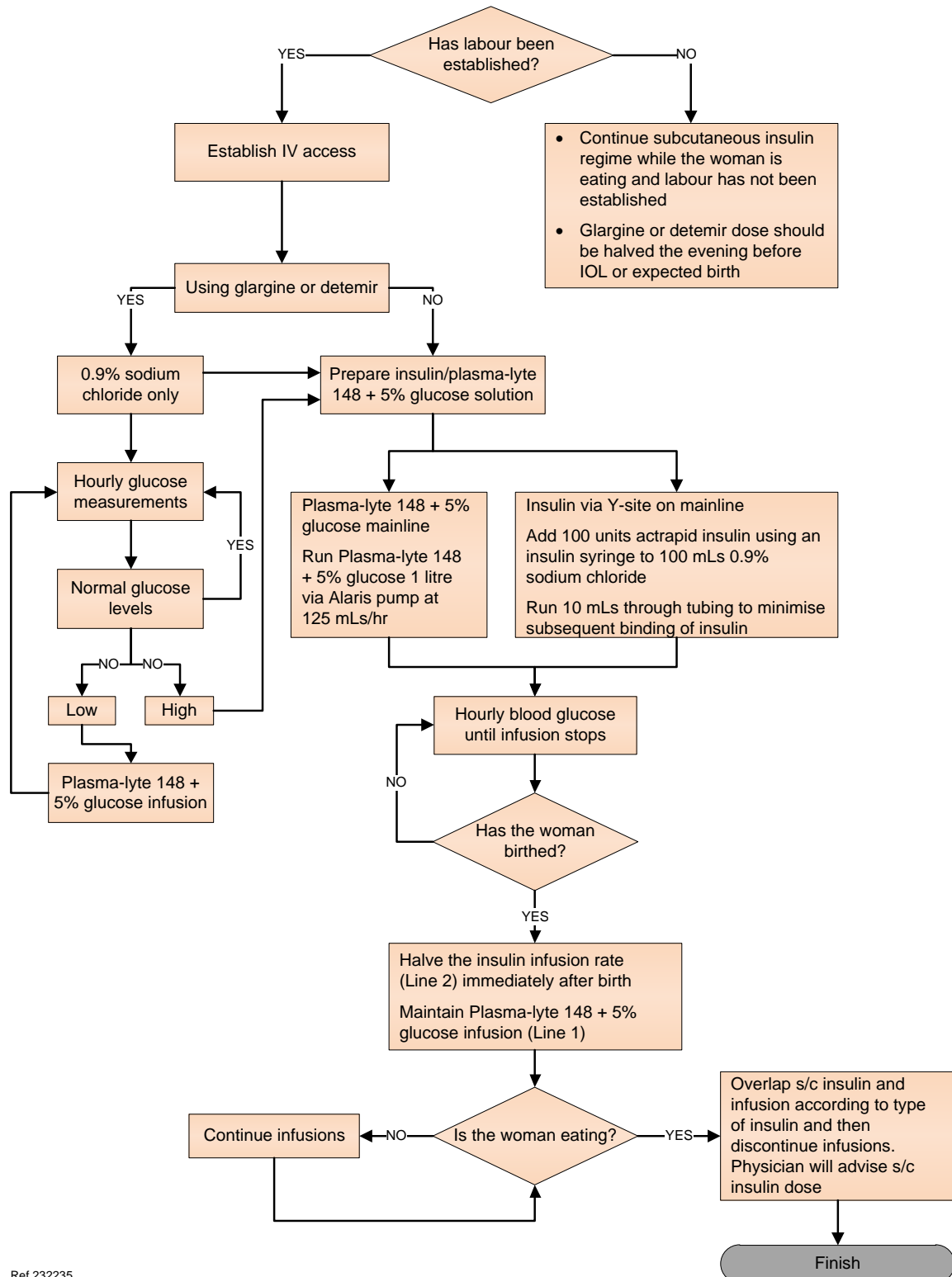
- Two intravenous lines are to be sited. One for insulin / Plasma-Lyte 148 + 5% glucose infusion and one for oxytocin/anaesthetic/analgesic requirements.
- No glucose containing infusions, other than the fixed rate of Plasma-Lyte 148 + 5% glucose, should be administered.
- The intravenous line for the insulin / Plasma-Lyte 148 + 5% glucose infusion 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 Alaris infusion pump. DO NOT ALTER.
- Insulin via Y-site on main line
 - Add 100 Units Actrapid insulin using an insulin syringe to 100 mLs 0.9% sodium chloride and run via an infusion pump.
 - Run 10 mLs through the tubing before attaching 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 woman is ready to eat.
- Document blood glucose level on the Diabetes Testing and Treatment Form C180009 (Ref.2219)
- Document accurately fluid input in the Fluid Balance 24-Hour Sheet QF00372.

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

**APPENDIX B: TYPE 1 DIABETES
INDUCTION OF LABOUR/SPONTANEOUS LABOUR**



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