NHS Greater Glasgow and Clyde

CLINICAL GUIDELINE

Diabetes Management for Women During Labour and Birth

A guideline is intended to assist healthcare professionals in the choice of disease-specific treatments.

Clinical judgement should be exercised on the applicability of any guideline, influenced by individual patient characteristics. Clinicians should be mindful of the potential for harmful polypharmacy and increased susceptibility to adverse drug reactions in patients with multiple morbidities or frailty.

If, after discussion with the patient or carer, there are good reasons for not following a guideline, it is good practice to record these and communicate them to others involved in the care of the patient.

Version Number:	3
Are there changes to the clinical advice in this version?:	Yes
Date Approved:	8th August 2024
Date of Next Review:	31st August 2028
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Approval Group:	Maternity Clinical Governance Group

Important Note:

The Intranet version of this document is the only version that is maintained.
Any printed copies should therefore be viewed as 'Uncontrolled' and as such, may not necessarily contain the latest updates and amendments.

AIM/OBJECTIVE OF GUIDELINE

This guideline covers diabetes management of women requiring insulin for labour and birth. It aims to improve person centred care and ensure the most effective treatments/pathways for women are carried out.

INTRODUCTION/BACKGROUND

This refers to the diabetes management of all women during labour and birth, whether requiring insulin or not.

SCOPE

GGC Maternity staff, this guidance is written for and applies to Obstetric, Midwifery and Diabetology staff involved in caring for pregnant women during labour and birth.

ROLES/RESPONSIBILITIES

All midwives, obstetric staff and anyone else providing clinical care or guidance to women during labour and birth, should observe the guidelines and ensure that local protocols and medical advice from specialist are sought.

GUIDELINE

A. LABOUR AND BIRTH

ALL WOMEN SHOULD BE FASTED DURING LABOUR
AVOID HARTMANN'S INTRAVENOUS SOLUTIONS
DURING LABOUR TARGETS – CAPILLARY BLOOD GLUCOSE LEVEL IS 5 – 8 MMOL/l

SECTION 1: WOMEN WITH GESTATIONAL DIABETES OR TYPE 2 DIABETES ON DIET, METFORMIN OR UP TO 20 UNITS OF BASAL INSULIN PER DAY DURING PREGNANCY

DURING LABOUR AND BIRTH
In women with **Gestational Diabetes** (GDM)- or unusually type 2 diabetes- controlled by diet or diet and metformin or in women on less than 20units basal (long-acting) insulin per day at end of pregnancy (eg Levemir, Humulin I and equivalents as below) , management should be as per normal labour and birth Guidelines with the addition of:-

1. Discontinue metformin and subcutaneous insulin when in established labour or when fasting
2. Check capillary blood glucose (CBG) hourly:
   If capillary blood glucose >8.0 mmoll/L on two occasions or >10.0 mmol/L on one occasion then consider commencement of VRIII (see VRIII chart)

AFTER BIRTH

- For women with gestational diabetes both metformin and insulin will almost always be planned to be stopped at birth. Expect to stop unless there is clear instruction from the diabetes team to continue.
- Check CBG's before meals at least once and for the first 24 hours if still in hospital. If any CBGs> 6mmol/L inform diabetes team next working day. (If any BMs >12 inform inpatient diabetes team)
- Include request for 3 month HbA1c in discharge letter to GP

SECTION 2: WOMEN REQUIRING OVER 20 UNITS BASAL INSULIN PER DAY DURING PREGNANCY (ALL WOMEN WITH TYPE 1 DIABETES, MOST WITH TYPE 2 DIABETES AND SOME WOMEN WITH GDM)

Terms: **Bolus**- Bolus insulin is the dose of short acting insulin given before meals to "cover" carbohydrate that is to be eaten. This bolus may be given by subcutanous injection or by insulin pump. Insulins used are typically Novorapid, FiASP and Humalog.
Basal- basal insulin ensures a continuous low level of insulin and is typically given as a "long acting" insulin such as Humulin I, Tresiba, Lantus, Abasaglar and Levemir. For women using an insulin pump this long acting insulin is replaced by a continuous infusion of insulin (NB quick acting insulin only).
Hybrid closed loop (HCL): automated insulin delivery system where basal insulin rate from pump is modified depending on continuous glucose monitoring readings

GENERAL PRINCIPLES

Aim is to maintain blood glucose between 5-8 mmol/l until birth
W**omen should not be left for long periods without background insulin whether given by long acting injection (do not omit for over 24 hours) or pump (do not suspend for over 1 hour).**
Women using insulin will require less insulin after delivery – this will often mean stopping insulin for women with insulin treated GDM and halving of doses in women with T1DM

SPONTANEOUS LABOUR

- Routine admission to labour ward
- Check capillary Blood Glucose (CBG)
- Inform Middle grade doctor who will discuss care with Consultant if obstetric concerns.
- Site and date two venflons, the first to be used for the VRIII if needed. The second to ensure secure IV access.
- Take bloods - Group & Save, FBC & UE's.
- Continuous EFM monitoring
- Inform On Call Paediatrician and Anaesthetist

DELIVERY & 3RD STAGE

Experienced personnel should be available for the management of the second & third stage of labour in pregnancy in a women with diabetes with suspected macrosomia.

INSULIN MANAGEMENT

Path 1: VRII : all women with traditional "basal bolus" pattern using basal insulin once or twice a day. All women usually using insulin pump where pump not available or active.

In these women VRIII should be commenced and continued during labour and delivery as per GG&C obstetric VRIII chart

Path 2: Hybrid Closed Loop : Some women will opt, after discussion with the diabetes team, to continue insulin by HCL through labour and delivery. If CBG >8 or any problems with the system VRIII (as per path 1) should be considered.

POST BIRTH

IMMEDIATE ACTIONS AT BIRTH

- **After birth women with diabetes require greatly reduced insulin doses**
- Immediately after birth of placenta stop VRIII (sliding scale), however Infusion should stay in place until main meal ready to be taken. Mother may be given tea and snack while infusion in place but not running.
- If using HCL, woman or birth partner will reduce insulin dosage by either changing to preset non HCL pump regimen (half pre-pregnancy settings) or continue HCL with higher glucose target (generally 8mmol/l with additional use of "EASE OFF" or similar function).
- Baby assessed by paediatrician

FIRST MEAL/ FIRST 4 HOURS

- **Recommence subcutaneous meal time insulin boluses at a dose of <u>50% usual pre-pregnancy dose</u> with the first normal meal** (as indicated in postnatal insulin regimen plan in notes). This applies whether bolus insulin given by pump or sc injection
- Check CBG's hourly until first meal eaten and before subsequent meals thereafter.
- Continue to give 50% pre-pregnancy subcutaneous insulin with each meal for at least the first 24 hours. Half of the evening pre-pregnancy dose of long acting insulin should also be given.
- Women using an insulin pump with or without hybrid closed loop will have been given instruction on reduced insulin infusion rates- usually half of pre-pregnancy doses and running HCL at higher target glucose
- If breast feeding will require increased carbohydrate (with advice from dietician) and potentially less insulin aiming for a pre-meal BM of 7-12 mmols/l
- **If CBG > 12mmols /L and not eating normally recommence VRIII at reduced doses unless otherwise instructed by diabetes team** (Table 1)
- If hypoglycaemia occurs reduce insulin further from pre-pregnancy dosages.
- Liaise with Diabetic team.
- After the first 24 hours insulin requirement may increase towards normal pre-pregnancy doses.

Table 1 : Sliding scale for Diabetes in Labour if bolus of subcutaneous insulin has been taken less than 4 hours previously OR postpartum (NB need for sliding scale post-partum is unusual)

Capillary Blood glucose	**Insulin (Units per hour=ml per hour)**	**Revision of sliding scale if required**	**Revision of sliding scale if required**
0.0-4.0	**STOP INSULIN This is a hypo: assess patient and treat**		
4.1-7.0	0		
7.1-10.0	1		
10.1-14.0	2		
> 14.0	3		
	SIGNED	SIGNED	SIGNED
	Date/ Time	**Date/ Time**	**Date/ Time**
	Target **Capillary Blood glucose is 5-8 in labour, 5-10 post partum**		
Target Action/revision	*During labour: If **Capillary Blood glucose >** 7 mmol/l for 2 consecutive hours despite sliding scale contact medical staff for revision of sliding scale.* *Postpartum: If **Capillary Blood glucose >** 14 mmol/l for 2 consecutive hours despite sliding scale co*		

Postpartum women with GDM and pregnancy doses of basal insulin >20 units

- For women with gestational diabetes both metformin and insulin will almost always be planned to be stopped at birth. Expect to stop unless there is clear instruction from the diabetes team to continue.
- Check CBG's before meals at least once and for the first 24 hours if still in hospital. If any CBGs> 6mmol/L inform diabetes team next working day. (If any BMs >12 inform inpatient diabetes team)
- Include request for 3 month HbA1c in discharge letter to GP

B. INDUCTION OF LABOUR

- Admit to ward evening prior to induction
- Each woman should have individualised plan of care regarding insulin and prostin doses
- Take bloods Group & Save, FBC & UE's.
- Give evening prostin if prescribed
- Give usual evening dose of long acting insulin if Insulatard/Humulin I,* **but only give 70% usual insulin if Lantus/Abasaglar/ Levemir/Tresiba**
- Women using insulin pumps with or without hybrid closed loop should continue their usual doses/ management

- **Reassess cervix at 0600- 07.00**

- <u>If cervix favourable for ARM Transfer labour ward circa 0730</u>
- Site and date 2 Venflons (16g)
- No morning **bolus** insulin to be given (women on insulin pump should continue their usual insulin)

INSULIN MANAGEMENT

Path 1: VRIII: all women with traditional "basal bolus" pattern using basal insulin once or twice a day. All women usually using insulin pump where pump not available or active.

- In these women VRIII should be commenced at 0800 and continued during labour and delivery as per GG&C obstetric VRIII chart
- If morning prostin required may have tea & toast/breakfast with usual insulin bolus given.
- If no breakfast insulin (or with first missed meal) commence sliding scale
- Adjust sliding scale as needed to cover insulin requirements.

Path 2: Hybrid Closed Loop: Some women will opt, after discussion with the diabetes team, to continue insulin by HCL through labour and delivery.

- If morning prostin required may have tea & toast/breakfast with usual insulin bolus given.
- If CBG >8 or any problems with the system then VRIII (as per path 1) should be considered

- Care in labour as detailed for spontaneous labour (above)
- Post birth: follow same regimen as outlined for spontaneous labour (above)

C. PLANNED CAESAREAN BIRTH

- Admit to ward the previous evening
- Each woman should have individualised plan of care regarding insulin doses
- Take bloods Group & Save, FBC & UE's.
- Give usual evening dose of long acting insulin if Insulatard/Humulin I,* **but only give 70% usual insulin if Lantus/Abasaglar/ Levemir/Tresiba ***
- Fast from 12 midnight
- **Transfer to labour ward 0730**
- Site 2 Venflons (16g)
- No morning short acting, bolus insulin to be given

Path 1 (VRIII):

Check BM and commence sliding scale at 0800 (labour ward)

Post delivery: follow same regimen as outlined for spontaneous labour ("IMMEDIATE ACTIONS"/ FIRST MEAL/ FIRST 4 HOURS above)

Path 2: Hybrid Closed Loop : Some women will opt, after discussion with the diabetes team, to continue insulin by HCL immediately up to and after their .section.

The anesthetist/ surgeon may ask for pump to be removed during procedure if diathermy is to be used. This is acceptable if the procedure is short . **AN INSULIN PUMP SHOULD NOT BE REMOVED FOR > 1 HOUR WITHOUT AN ALTERNATIVE SOURCE OF INSULIN BEING PUT IN PLACE**

Post delivery: follow same regimen as outlined for spontaneous labour (above) with restart of HCL with revised target BG (usually 8mmol/l)

If CBG >8 or any problems with the system VRIII (as per path 1) Path 1 (VRIII): **Check BM and commence sliding scale at 0800 (labour ward)**

REFERENCES/ ADDITIONAL READING

https://abcd.care/sites/default/files/site_uploads/JBDS_Guidelines_Current/JBDS_12_Managing_diabetes_and_hyperglycaemia_during_labour_and_birth_with_QR_code_February_2023.pdf