Diabetic Management of the Obstetrical Patient Guideline

Approved by:
Director, Women's Health, Covenant Health, GNH/MCH
Facility Chiefs Diabetic/ Metabolic center, GNCH/MCH
Facility Chiefs, Obstetrics/Gynecology, GNH/MCH

Purpose
To provide guidelines to ensure consistency in the care of Diabetic patients in Women's Health

Guideline Statement
Women's Health staff will care for Diabetic patients and adhere to Covenant Health Policy and Guidelines. Staff and physicians in Women's Health will demonstrate a commitment to the safety of all patients when using this policy and procedure.

Applicability
Applies to GNCH & MCH Covenant Health Women's Health staff.

Principles
- To provide written guidelines to facilitate glycemic management of the pregnant diabetic patient during the antepartum, intrapartum, intra-operative and postpartum periods.
- The patient is considered to be labouring when she has regular uterine contractions plus cervical change (dilatation and effacement) and descent of presenting part. (MOREOB).
- Diabetic patients being induced with oxytocin should follow Intrapartum management guidelines upon initiation of oxytocin.
- Pregnant diabetic patients are divided into two plans of care based on their condition and insulin requirements at the time of admission:

| Plan A                        | Patients with gestational diabetes mellitus (GDM) or Type 2 diabetes on diet therapy alone.  
|------------------------------|-------------------------------------------------------------------------------------------|
|                              | Patients requiring less than 1 unit of insulin/kilogram body weight in the 24 hours prior to delivery.  

| Plan B                        | Patients with Type 1 diabetes; Include patients on a continuous Insulin pump  
|------------------------------|---------------------------------------------------------------------------------------|
|                              | Patients with Gestational Diabetes or Type 2 diabetes who require equal to or more than 1 unit of insulin/kilogram body weight in the 24 hours prior to delivery.  

- The Attending Physician, Endocrinologists, or Internal Medicine can initiate any of the above plans of care.
- If there are concerns about patient orders or condition, call the Attending Physician first. At the direction of the Attending Physician, page the Internal Medicine/Endocrinologist on call to discuss concerns.
- On admission, patient’s current insulin usage is to be documented on Medication Reconciliation forms.
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Date Effective
July 2016

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Procedure

**Ante Partum Management**

**Plan A**

- On admission the Attending Physician will provide orders for insulin and diabetic diets.
- If the patient is not admitted for diabetic concerns, the patient should continue to follow their outpatient orders.
- Notify the Diabetic Clinic of patient’s admission to hospital, if applicable.
- Capillary glucose monitoring:

<table>
<thead>
<tr>
<th>Time of Testing</th>
<th>Target Glucose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting</td>
<td>Less than 5.3 mmol/L</td>
</tr>
<tr>
<td>One hour post meals (PC)</td>
<td>Less than 7.8 mmol/L</td>
</tr>
<tr>
<td>Two hours post meal (PC)</td>
<td>Less than 6.7 mmol/L</td>
</tr>
</tbody>
</table>

- If capillary glucose is **less than or equal to 3.8 mmol/L**, treat hypoglycemia with ¾ cup of juice or 3 teaspoons of sugar. **Repeat capillary glucose and treatment every 15 minutes until capillary glucose is greater than 3.8 mmol/L.** Notify Attending physician if the patient has two consecutive readings of less than or equal to 3.8 mmol/L.
- If capillary glucose is **greater than 12 mmol/L**, call Attending Physician to consult Endocrinologist/Internist on call.
- Staff to record capillary glucose values on Diabetic Record in chart.

**Plan B**

- On admission the Attending Physician to provide orders for Diabetic diets.
- If the patient is not admitted for diabetic concerns, the patient should continue to follow their outpatient orders.
- Notify the Diabetic Clinic of patients’ admission to hospital.
- Capillary glucose monitoring:

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If the capillary glucose is **less than or equal to 3.8 mmol/L**, treat hypoglycemia with ¾ cup of juice or 3 teaspoons of sugar. **Repeat capillary glucose and treatment every 15 minutes until capillary glucose is greater than 3.8 mmol/L.** Notify Attending physician if the patient has two consecutive readings of less than or equal to 3.8 mmol/L.

If capillary glucose is **greater than 12 mmol/L**, call Attending Physician to consult Endocrinologist/Internist on call.

Patient may titrate their own subcutaneous insulin or insulin pump basal rate/bolus ratios as per their outpatient orders.

Staff to record capillary glucose values on Diabetic Record in chart.

**Intra Partum Management**

**Plan A**

- **For Patients that are followed by the Diabetic Clinic during their pregnancy, the Diabetic Clinic will complete the Diabetic Orders for Intrapartum and Postpartum Management.** The orders will be filled out at approximately 36 weeks gestation and given to the patient. The patient is to bring the signed orders to the hospital either at the onset of labour or for a scheduled delivery.

- The Attending Physician is to initiate the orders for intravenous therapy and diet.

- **Capillary Glucose to be assessed on admission and every 2 hours or as needed**

**Table 1**

<table>
<thead>
<tr>
<th>Capillary Glucose Value</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than or equal to 3.8 mmol/L</td>
<td>Treat hypoglycaemia with ¾ cup juice or 3 teaspoons sugar. <strong>Repeat capillary glucose and treatment every 15 minutes until capillary glucose is greater than 3.8 mmol/L.</strong> Notify Attending Physician with 2 consecutive readings less than or equal to 3.8 mmol/L. If Patient is NPO, initiate D10W with 20 mEq of KCL at 50mL/hr. Notify Attending Physician and recheck capillary glucose in 1 hour.</td>
</tr>
<tr>
<td>3.9 mmol/L to 6.5 mmol/L</td>
<td>Monitor capillary glucose every 2 hours.</td>
</tr>
<tr>
<td>Greater than 6.5 mmol/L for 2 consecutive readings</td>
<td>Notify Attending Physician to discuss the need to initiate Plan B.</td>
</tr>
</tbody>
</table>

- Monitor urine ketones every 2 hours when actively labouring or when being induced with Oxytocin. (see Table 2)
### Table 2

<table>
<thead>
<tr>
<th>Urine Ketone Value</th>
<th>Action</th>
</tr>
</thead>
</table>
| Greater than 3+    | - Initiate IV D10W (1000ml) with 20 mEq of KCL at 50 mL/hour  
                     - Recheck urine in 1 hour  
                     - Stop D10W IV if capillary glucose is greater than 7 mmol/L |
| Greater than or equal to 1+ or Less than 3+ | - Offer oral fluids (i.e. Juice)  
                                                        - Continue to monitor urine every 2 hours |

### Intra Partum Management

#### Plan B
- For Patients that are followed by the Diabetic Clinic during their pregnancy, the Diabetic Clinic will complete the Diabetic Orders for Intrapartum and Postpartum Management. The orders will be filled out at approximately 36 weeks gestation and given to the patient. The patient is to bring the signed orders to the hospital either at the onset of labour or for a scheduled delivery.

- All Intra Partum patients following Plan B require Intravenous Management. The Attending Physician to provide orders for the control (first line).

- Diet should be specified and ordered by the Attending Physician.

- Monitor urine ketones every 2 hours when actively labouring or when being induced with Oxytocin. (see Table 3)

#### Table 3

<table>
<thead>
<tr>
<th>Urine Ketone Value</th>
<th>Action</th>
</tr>
</thead>
</table>
| Greater than or equal to 3+ and capillary glucose is less than 7 mmol/L | - Notify Attending Physician  
                                                                             - Recheck urine in 1 hour |
| Greater than or equal to 1+ or Less than 3+ | - Offer oral fluids (i.e. Juice)  
                                                        - Continue to monitor urine every 2 hours  
                                                        - Notify Attending at next patient status update. |

- Capillary glucose to be taken on admission and then every hour until delivery.
- Adjust insulin infusion and Dextrose infusion as indicated in Table A.
- If patient is on a continuous insulin infusion pump, the patient is to disconnect the pump immediately prior to initiation of diabetic intravenous management.
Initiation of Intravenous Management

- See Appendix A for details and necessary extension sets.
- Label all IV tubing,
- Insulin to be labeled at the **lowest port**.

- **Control IV (First Line)**
  - Initiate IV therapy with NaCL 0.9% or Lactated Ringers.
  - Regulate rate on an infusion pump from 15-30ml/hour. This infusion line may be turned off if the second and third lines are infusing.

- **Dextrose Infusion (Second Line)**
  - IV D10W (1000 mL ) with 20 mEq of KCL.
  - Infuse at 50ml/hour and regulate the rate on an infusion pump.

- **Insulin Infusion (Third Line)**
  - Prepare Insulin IV solution: 100 mL of NaCL 0.9% with 100 units of regular insulin (concentration = 1 unit/mL)
  - Prime the Insulin infusion set with 25 to 50 mL of insulin solution to saturate the binding sites in the tubing. (Refer to parenteral monograph for “insulin regular”) and regulate the rate on an infusion pump.
  - Initial rate of insulin infusion is 1 unit/hour.
  - If capillary glucose is less than or equal to 3.8 mmol/L, on admission. Start IV dextrose as per instruction. Recheck capillary glucose every 15 minutes until levels are greater than 3.8 mmol/L then start IV insulin infusion.

- Call Attending Physician to consult Endocrinologist, if capillary glucose on two consecutive readings is **less than or equal to 3.8 mmol/L or greater than 12 mmol/L**.
- If Insulin infusion has been stopped and the patient’s glucose rises to greater than 5.0 mmol/L restart the infusion at 0.5 units/hr.

Plan B continued on next page.
Intra Partum Management

Plan B (Continued)

Table A: Infusion Rate Adjustment Table

<table>
<thead>
<tr>
<th>Capillary Blood Glucose (mmol/L)</th>
<th>Insulin Infusion Rate Adjustment (unit/hour= mL/hour)</th>
<th>Dextrose Infusion Adjustment (D10W with 20mEq of KCL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than or equal to 3</td>
<td>Stop for 1 hour</td>
<td>Increase Dextrose to 100mL/hour</td>
</tr>
<tr>
<td>3.1 – 3.5 mmol/L</td>
<td>Decrease by 0.1 units/hour</td>
<td>Increase Dextrose to 75 mL/hour</td>
</tr>
<tr>
<td>3.6 – 4 mmol/L</td>
<td>Decrease by 0.5 units/hour</td>
<td>Maintain Dextrose at 50mL/hour</td>
</tr>
<tr>
<td>4.1 – 6.0 mmol/L</td>
<td>Do not change rate</td>
<td>Maintain Dextrose at 50 mL/hour</td>
</tr>
<tr>
<td>6.1 – 7.0 mmol/L</td>
<td>Increase by 0.5 units/hour</td>
<td>Maintain Dextrose at 50 mL/hour</td>
</tr>
<tr>
<td>7.1 – 8.5 mmol/L</td>
<td>Increase by 1 units/hour</td>
<td>Maintain Dextrose at 50 mL/hour</td>
</tr>
<tr>
<td>8.6 – 10.0 mmol/L</td>
<td>Increase by 1.5 units/hour</td>
<td>Maintain Dextrose at 50 mL/hour</td>
</tr>
<tr>
<td>10.1 – 12 mmol/L</td>
<td>Increase by 2 units/hour</td>
<td>Maintain Dextrose at 50 mL/hour</td>
</tr>
<tr>
<td>Greater than 12 mmol/L</td>
<td>Increase by 2 units/hour</td>
<td>Stop Dextrose for 1 hour</td>
</tr>
</tbody>
</table>

*If the capillary glucose falls by greater than 2mmol/L in 1 hour and it is now:*

| Greater than 5.0mmol/L          | Decrease insulin to 1 unit/hr                        | Infuse Dextrose at 50mL/hour                       |
| Less than 5.0 mmol/L           | Stop Insulin for 1 hour                              | Infuse Dextrose at 50mL/hour                       |

Caesarean Sections

- An attempt should be made to schedule the elective caesarean section as the first case of the day.

Plan A

Pre-Operative Management

- Initiate control IV NaCL 0.9% or as ordered; admitting service can decide maintenance fluid of choice. (See Appendix A for set up).
- Capillary glucose to be assessed on admission
Plan A (continued)

Day of Caesarean Section
- Assess capillary glucose on arrival to hospital.
- If the Caesarean Section is delayed by more than one hour check capillary glucose hourly, follow Table 6 guidelines for management.

Table 6

<table>
<thead>
<tr>
<th>Capillary Glucose Value</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than or equal to 3.8 mmol/L</td>
<td>Initiate D10W with 20mEq of KCL at 50mL/hour, monitor capillary glucose hourly. Notify Physician.</td>
</tr>
<tr>
<td>Less than 6.5 mmol/L</td>
<td>Monitor capillary glucose every 2 hours</td>
</tr>
<tr>
<td>Greater than 6.5 mmol/L for 2 consecutive readings</td>
<td>Notify Attending Physician to discuss change over to Plan B</td>
</tr>
</tbody>
</table>

Plan B

Pre-Operative Management
- Initiate control IV NaCl 0.9% or as ordered; Attending Physician can decide maintenance fluid of choice. (See Appendix A for set up).

Day of Caesarean Section (Continued on next page)
- All patients following Plan B require Intravenous Insulin Management.
- If the patient is on a continuous insulin infusion pump, patient is to disconnect immediately prior to initiation of the Intravenous Management.
- If the Caesarean Section is delayed by more than one hour, check capillary glucose hourly, follow Table A (Page 5): Infusion Rate Adjustment Table.

- Control IV (First Line)
  - Initiate IV therapy with NaCl 0.9% or Lactated Ringers.
  - Regulate rate on an infusion pump from 15-30ml/hour. This infusion line may be turned off if the second and third lines are infusing.

- Dextrose Infusion (Second Line)
  - IV D10W (1000 mL ) with 20 mEq of KCL.
  - Infuse at 50ml/hour and regulate the rate on an infusion pump.

- Insulin Infusion (Third Line)
  - Prepare Insulin IV solution: 100 mL of NaCl 0.9% with 100 units of regular insulin (concentration = 1 unit/mL)
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- Prime the Insulin infusion set with 25 to 50 mL of insulin solution to saturate the binding sites in the tubing. (Refer to parenteral monograph for “insulin regular”) and regulate the rate on an infusion pump.

- Initial rate of insulin infusion is 1 unit/hour.

- If capillary glucose is less than or equal to 3.8 mmol/L, on admission. Start IV dextrose as per instruction. **Recheck capillary glucose every 15 minutes until levels are greater than 3.8 mmol/L then start IV insulin infusion.**

### Post-Partum/ Post-Operative Management

- All diabetic women should be encouraged to **breastfeed immediately after delivery in order to avoid neonatal hypoglycemia.**

#### Plan A

- On admission to Recovery Room or Postpartum Unit check capillary glucose.
- Capillary glucose to be monitored two hours post meals for duration of hospital stay up to 48 hours.
- If the capillary glucose is **less than or equal to 3.8 mmol/L**, treat hypoglycemia with ¾ cup of juice or 3 teaspoons of sugar. **Repeat every 15 minutes until capillary glucose is greater than 3.8 mmol/L.** Notify Attending physician if the patient has two consecutive readings less than or equal to 3.8 mmol/L.
- If capillary glucose is **greater than 15 mmol/L.** notify the Attending Physician.
- If intravenous therapy (Plan B) for diabetic management was established in the Intrapartum period:
  - Discontinue insulin infusion on delivery of the placenta
  - Continue Dextrose infusion (D10W with 20mEq of KCL) at 50 mL hr until diet as tolerated.
  - If capillary glucose is **greater than 7 mmol/L**, discontinue dextrose infusion and run NaCL 0.9% (first line/control IV) at 50 mL/hr.
  - If the patient is not on a dextrose infusion, continue IV until diet as tolerated or per post operative caesarean orders.

- Patient recommended diet post-delivery:

<table>
<thead>
<tr>
<th>Patient Type</th>
<th>Diet to follow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with GDM</td>
<td>Regular diet following delivery</td>
</tr>
<tr>
<td>Patients with Diabetes - not breastfeeding</td>
<td>1800 kcal diabetic diet</td>
</tr>
<tr>
<td>Patients with Diabetes- breastfeeding</td>
<td>2200 kcal diabetic diet</td>
</tr>
</tbody>
</table>
Plan B

This plan is intended for patients that met PLAN B criteria on admission.

Type 1 Diabetic Patient

- Continue intravenous management established on admission
- Check patient capillary glucose on admission to recovery room for caesarean sections and postpartum.
- Continue to monitor capillary glucose every hour until IV insulin infusion is discontinued.
- Follow insulin infusion in Table A (page 5).
- Once tolerating diet (refer to Table 4), patient should restart their insulin subcutaneously or via personal pump. At the same time, discontinue dextrose infusion (D10W with 20mEq KCL) and insulin infusion at this time.
- Once IV insulin is discontinued, monitor capillary glucose every two hours x 2, then every four hours x 2, and then before meals and at bedtime for the remainder of their hospital stay.
- Target capillary glucose is less than 7 mmol/L before meals and less than 15mmol/L after meals.
- If capillary glucose is less than or equal to 3.8 mmol/L, treat with ¾ cup of juice or 3 teaspoons of sugar. Repeat every 15 minutes until capillary glucose is greater than 3.8 mmol/L. Notify Attending Physician if the patient has two consecutive readings of less than or equal to 3.8mmol/L.
- If capillary glucose is greater than 15 mmol/L, notify the Attending Physician.
- Staff to record capillary glucose values on Diabetic Record in chart.

Type 2 Diabetes and GDM Patients (Continued on next page)

- Discontinue insulin infusion upon delivery of the placenta
- Patient to monitor capillary glucose every 2 hours x 2, then fasting and 2 hours post-meals for the remainder of their hospital stay.
- Check capillary glucose on admission to Recovery Room if applicable.
- Continue the Dextrose infusion (D10W with 20mEq KCL) at 50ml/hour until tolerating fluids well. If the capillary glucose is greater than 7.0 mmol/L, change IV to NaCL 0.9% at 50mL/hour.
- Refer to Table 4 for appropriate diet guidelines.
- If capillary glucose is less than or equal to 3.8 mmol/L, treat with ¾ cup of juice or 3 teaspoons of sugar. Repeat every 15 minutes until capillary glucose is greater than 3.8 mmol/L. Notify Attending Physician if the patient has two consecutive readings of less than or equal to 3.8 mmol/L.
- If capillary glucose is greater than 15 mmol/L, notify the Attending Physician.
- Staff to record capillary glucose values on Diabetic Record in chart.
Appendix A

IV line set up for diabetic patients:

Special considerations for fluid management

- If hypotension from regional anaesthesia/analgesia or haemorrhaging is present, the fluid of choice can be considered by anaesthesia or obstetrical services.

1. Control IV Normal Saline (0.9% NaCl)
2. Dextrose infusion (D10W with 20mEq KCL)
3. Line Infusion 100 units of regular insulin in 100ml of 0.9% NaCL

Oxytocin is attached to Line 1. (into control line)

Other medications can be attached here.

IV Extension set for IV push medications.

3- lead extension set

Supplies need:
1- 3 lead (red/yellow/blue extension set)
1- IV Extension set
3 x Alaris pump tubing
1x D10W with 20mEq KCL (in pyxis)
1- 100ml mini bag of normal saline
Regular Insulin Vial
Labels for all lines
## Related Documents
- Provincial ADULT Standardized Medication Concentrations for Parenteral Administration

## References


## Revisions
- Original August 2005
- Revised September 2012