Preamble

Under the Indications for Discussion, Consultation and Transfer of Care, providing primary care for a pregnant woman with pre-existing Type 1 Insulin Dependent Diabetes Mellitus (IDDM) is outside of the scope of practice of a BC midwife. Women who develop Gestational Diabetes Mellitus (GDM) during pregnancy may be managed with insulin and in many of these cases a midwife can manage the woman’s care with physician consultation or shared care as indicated.

GDM affects 2-10% of all pregnant women\(^1\). Opinions vary regarding GDM testing in pregnancy and depending on testing methods there is a discrepant percentage range of detection. At 24-28 weeks gestation GDM can be detected in 10% of all pregnancies when the 50g OGTT is applied, and this range rises to 18% of all pregnancies when the fasting plasma glucose and the 75 gram OGTT is applied\(^2\).

Although there has been controversy regarding which diagnostic tests and standards to use for GDM, there is agreement that excellent blood glucose control is possible with diet and exercise. When necessary, insulin or oral hypoglycemic agents result in improved perinatal outcomes. (Please refer to the CMBC Standards, Limits and Conditions for Ordering and Interpreting Screening and Diagnostic Tests for options on testing\(^3\)).

The value of treating gestational diabetes was evaluated in two large randomized clinical trials (4, 8) where women with mild GDM were assigned to either GDM treatment group or routine obstetrical care. Although the trials differed in the methods of diagnosis of mild GDM, the results observed in both trials showed a significant decrease in macrosomia. In both trials the reduction in macrosomia was associated with a significant decrease in shoulder dystocia, nerve palsy, bone fracture and death. One trial showed a significant reduction in cesarean delivery in the treatment group, however the other trial did not.

Although only a small proportion of women require intervention beyond dietary management, the overall importance of providing appropriate therapy with the goal to maintain normal blood glucose levels and appropriate maternal weight gain can decrease maternal and fetal morbidity. Diagnosing and treating gestational diabetes is associated with lower rates of preeclampsia, gestational hypertension, obstetrical interventions and maternal and fetal health concerns (1, 4, 9).

This guideline for midwives reflects the midwife’s scope of practice as a primary care provider with the expectation that the midwife will use her best clinical judgment in assessing and responding to each woman’s pregnancy, labour and postpartum to incorporate appropriate monitoring of maternal, fetal and newborn well-being within her plan of care. It should be used in combination with the College’s Indications for Discussion, Consultation and Transfer of Care and Indications for Planned Place of Birth, as well as other College guidelines and the

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\(^1\) Medical management and follow up of gestational diabetes mellitus. Retrieved May 8, 2013 from UpToDate.

\(^2\) The International Association of the Diabetes and Pregnancy Study Groups (IADPSG)

\(^3\) Standards, Limits & Conditions for Ordering & Interpreting Screening & Diagnostic Tests
midwife’s own practice protocols for the provision of care in pregnancy, labour and the postpartum period.

The midwife uses this guideline or an equivalent evidence-based practice protocol and documents clinical management when abnormal findings are present. The following is a general approach for the treatment of GDM consisting of dietary therapy, self-blood glucose monitoring and insulin administration in the event that target blood glucose concentrations are not met by dietary measures alone.

Care provided in collaboration with a multidisciplinary team together with the midwife and her client is strongly recommended when caring for women with gestational diabetes. The midwife should provide information to the client throughout the course of the pregnancy, labour and the postpartum period so that she can participate in the decision-making process. Information about available education programs should be provided with a goal to improve pregnancy outcomes and to promote healthy lifestyle changes for the mother that will last well beyond the birth (8).

A) Gestational diabetes mellitus: Non-insulin management

Recommendations for Pregnancy

- Early referral of the woman to a diabetes clinic or management consultant is recommended when GDM is detected for nutritional counseling, exercise advice, education and/or treatment including self-blood glucose monitoring and glucose-lowering therapy if needed.
- Women with GDM should strive to maintain the following target glucose values.

<table>
<thead>
<tr>
<th>Glucose Value</th>
<th>Target Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting Plasma Glucose</td>
<td>&lt;5.3 mmol/L</td>
</tr>
<tr>
<td>1-hour postprandial</td>
<td>&lt;7.8 mmol/L</td>
</tr>
<tr>
<td>2-hour postprandial</td>
<td>&lt;6.7 mmol/L</td>
</tr>
</tbody>
</table>

- Women with GDM should be offered dietary advice as achieving glycemic control with nutrition therapy, which often results in decreased frequency of glucose monitoring and improves perinatal outcomes. Nutritional therapy is the initial approach which includes: three meals and two to four snacks each composed of approximately 40% carbohydrate, 20% protein, 40% fat.
- Moderate physical exercise is recommended as it has been shown to lower maternal glucose concentrations in women with GDM

- Women should be informed that optimal glycemic control during and immediately after pregnancy can reduce risks and improve overall wellness.
- Avoid ketosis during pregnancy.
- Recommendations for weight gain during pregnancy should be based on pre-gravid BMI.
- When glycemic control is not achieved with nutrition therapy and exercise within 2 weeks, further management may be required (see section B below).
- Review the importance of a detailed obstetrical ultrasound including four chamber cardiac view and outflow tracts as cardiac anomalies can be related to pre-existing diabetes.

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- Women with GDM should be taught to perform fetal movement counting on a regular basis in the third trimester.
- Consider antenatal fetal surveillance, including NSTs, AFI/BPP, and/or serial growth ultrasound scans, if the blood sugars are not well controlled, or if there are any additional risk factors, such as IUGR, hypertension or prolonged pregnancy (2).
- Where intrauterine growth restriction (IUGR) is suspected, regular monitoring including growth scans and umbilical artery Doppler should be carried out.
- **If antenatal surveillance identifies abnormal findings, physician consultation is required.**
- Induction of labour or scheduled cesarean section may be considered by obstetrical consultant at or after 38 weeks if blood glucose levels are not well controlled, for suspected macrosomia, or in the presence of additional risk factors. However, there is inadequate data at this time to recommend either intervention for the sole reason of suspected macrosomia in the absence of other risk factors (7, 13, 17).
- **Early term delivery is usually not recommended in uncomplicated pregnancies with well controlled glucose levels**

**Recommendations for Labour and Delivery**

- Maintain target glucose ranges according to the consultant's care plan recommendations. Maternal blood glucose levels should be kept between 4.0 and 7.0 mmol/L in order to minimize the risk of neonatal hypoglycemia.
- Women with gestational diabetes who maintain euglycemia antenatally with diet and exercise therapy can measure capillary blood glucose concentration on admission and then approximately every four to six hours and be managed according to care plan recommendations.
- The latent phase causes minimal change in maternal metabolic demands whereas active labor **should be viewed as intense exercise, with increased energy expenditure and decreased insulin requirements.**
- **When euglycemia is not maintained, further management or consultation may be required.**

**Recommendations for Postpartum – Maternal**

- Women should be encouraged to follow their nutrition guidelines, to exercise, and to achieve a healthy weight and glycemic control to prevent the development of Type 2 diabetes and its associated risks.
- Postpartum care and follow-up with an oral glucose tolerance test 6 to 12 wks after delivery, using a two-hour 75 gram oral glucose tolerance test is recommended to detect pre-diabetes and Type 2 diabetes.
- **Women who have an abnormal postpartum oral glucose tolerance test are classified as having pre-diabetes or diabetes mellitus, and therefore physician consultation is required.**

**Recommendations for Postpartum – Newborn**

- Infants of diabetic mothers are considered at-risk of developing neonatal hypoglycemia.
- Women with GDM should be encouraged to breastfeed as soon after birth as possible in order to avoid neonatal hypoglycaemia.
• Neonatal glucose monitoring is recommended at two hours after birth or whenever symptoms of hypoglycemia present. For at risk infants, blood glucose should be >2.6 mmol/L.

• Blood glucose levels <2.6 mmol/L, particularly if persistent or repeated, may be associated with adverse outcomes. If newborn blood glucose is 1.8-2.5 mmol/L, feed and recheck in one hour. (Refer to Algorithm below)5.

• **Physician consultation is required if blood glucose remains <2.6 mmol/L after adequate feeding or if blood glucose is <1.8 mmol/L at any time.**

• For persistent low blood glucose in the newborn, surveillance is continued for the first 12 to 24 hours of life. After 24 hours of life, screening should continue in infants with low plasma glucose concentrations (less than 2.6 mmol/L) until feedings are well established and glucose values have normalized.

• Neonatal cardiac and respiratory assessment including pulse oximetry in the presence of cyanosis.

• Routine newborn care should be provided unless there are complications that require further intervention.

• **Should hypoglycemia or symptoms of hypoglycemia develop that do not respond to treatment, physician consultation is required.**

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Figure 1) Screening for neonatal hypoglycemia. IDM Infant of diabetic mother; IV Intravenous; LGA Large-for-gestational-age; SGA Small-for-gestational-age. CPS Statement: www.cps.ca/english/statements/FN/fn04-01.htm
B) Gestational diabetes mellitus: Insulin management

- When target glucose levels are exceeded despite dietary and exercise therapy, a woman with GDM should be referred for consultation and consideration of insulin therapy. The dose and type of insulin is calculated based on the specific blood glucose results during monitoring.
- When the management plan includes insulin therapy, a schedule of ongoing obstetrical consultation visits or a plan for shared care of Insulin Treated Gestational Diabetes Mellitus (ITGDM) is indicated.
- Management of ITGDM includes all of the above listed recommendations for the non-insulin management, as well as the following additional recommendations.

Additional Recommendations for Pregnancy with ITGDM

- Insulin is generally recommended when blood glucose is not well controlled after two weeks of diet and exercise therapy.
- In women who require insulin therapy and self-monitoring blood glucose upon waking and one or two hours after each meal is recommended to guide dosages and times of administration, or dosages and timing can be addressed according to care plan recommendations.
- Insulin therapy in the form of multiple injections should be used.
- Rapid-acting bolus analogue insulin may be used over regular insulin for postprandial glucose control and as per recommendations.
- For women who decline insulin, glyburide or metformin may be used as alternative agents for glycemic control as prescribed by physician.
- Antenatal fetal surveillance including NSTs, AFIs/BPPs, and serial growth ultrasounds in the third trimester may be recommended by obstetrical consultant depending on degree of metabolic control and presence of additional risk factors.
- Induction of labour or scheduled cesarean section may be recommended by obstetrical consultant depending on degree of metabolic control, insulin dosage requirements, prolonged pregnancy, or presence of additional risk factors.

Additional Recommendations for Labour and Delivery with ITGDM

- Ensure physician orders for insulin and GDM management in labour are in place.
- Frequent monitoring of capillary blood glucose concentration: every two to four hours during the latent phase, every one to two hours during the active phase and every hour during insulin infusion or monitoring according to care plan recommendations.
- Maternal blood glucose levels should be kept between 4.0 and 7.0 mmol/L in order to minimize the risk of neonatal hypoglycemia. This can often be achieved without administration of insulin.
- Insulin is usually administered intravenously and titrated to achieve glycemic targets as per physician order.
- When euglycemia is not maintained, a physician consultation is required.
Additional Recommendations for Postpartum with ITGDM – Maternal

- Women with ITGDM need close glucose monitoring as insulin requirements drop precipitously following delivery.
- Oral agents may be started 24-48 hours postpartum and are considered safe during breastfeeding.

Additional Recommendations for Postpartum with ITGDM – Newborn

- Recommendations are consistent with those described in A) Recommendations for Postpartum – Newborn.

End Notes

Nutritional requirements:

For women at ideal body weight during pregnancy, caloric requirement is 30 kcal/kg/day, for overweight women, the caloric requirement is 22 to 25 kcal/kg/day and for obese women, the caloric requirement is 12 to 14 kcal/kg/day. Maternal GDM and obesity are independently associated with adverse pregnancy outcomes such as preeclampsia and excessive fetal growth. The combination of both has a greater impact than either disorder alone. Underweight women may have a caloric requirement of 40 kcal/kg/day to achieve recommended weight gain, blood glucose and nutritional goals.

Ideally carbohydrate intake should be distributed across three meals and two to four snacks and should be limited to less than 40 percent of total calories. Individual adjustments such as ensuring 15 to 30 g of carbohydrate at meals will depend on postprandial glucose levels. Postprandial blood glucose concentrations are directly dependent upon the carbohydrate content of the meal or snack and adjustments can be made accordingly. Women should be advised to minimize bread, rice, cereal, pasta, potatoes, and sweet fruits and juices. Complex carbohydrates (low glycemic index), such as those in starches and vegetables, raise postprandial blood glucose concentrations less than simple sugars.

Protein intake should be distributed throughout the day and included in all meals and snacks to provide adequate calories. A bedtime snack may be needed to prevent ketosis. Adjustment of the meal plan should be ongoing and based upon results of individual assessment and self-glucose monitoring, appetite, and weight gain patterns.

* If insulin therapy is added to nutrition therapy, a primary goal is to maintain carbohydrate consistency at meals and snacks to facilitate insulin adjustments.

Glucose monitoring:

Recommendations are for a woman with GDM to measure her blood glucose concentration at least four times daily (fasting and one or two hours after the first bite of each meal). Results should be recorded in a glucose log, along with dietary information.

Although there is no data on the duration of good control (sufficient to reduce frequency of self-monitoring or appropriate frequency of testing), many providers recommend decreasing
the frequency of glucose monitoring when glycemic control is accomplished with nutritional therapy. Further research to study this alternative approach is still needed.

The fetal abdominal circumference (AC) is a standard measurement by ultrasound and is reproducible in determining weights and growth patterns. Kjos et al suggests that it is reasonable for women with fetuses with large abdominal circumferences to receive insulin to decrease the risk of macrosomia, even if they have no or mild hyperglycemia. Likewise, it is reasonable to relax self-glucose monitoring and initiation of insulin for mild hyperglycemia in women whose fetuses have a small abdominal circumference (<75th percentile). Withholding insulin when there is no evidence of increased somatic growth may limit the risk of iatrogenic growth restriction.

References


11) Moore, Thomas R., MD; Chief Editor; Smith, Carl V., MD. Diabetes Mellitus and Pregnancy. October2, 2012 Medscape, Retrieved May 21, 2013


16) Up to date; Obstetrical management of pregnancies complicated by gestational diabetes mellitus. Accessed June 10, 2013