



Diabetes & Obesity in Pregnancy

Screening and Testing for Diabetes Mellitus (DM) & Gestational Diabetes (GDM)

- all pregnant women should be screened for diabetes in pregnancy with a 50g glucose challenge at 26-28 weeks.
- to reduce the risk of false positive results, women should have nothing to eat or drink except water for at least 3 hours before the test.
- If the 50g glucose challenge is positive (≥ 7.8 mmol/L), then a full 2hr 75g OGTT should be done.
- If the 50g glucose challenge is > 11.1 mmol/L, it is diagnostic for gestational diabetes.
- women with a history of prior gestational diabetes or with more than one risk factor (obesity, family history of T2DM, aboriginal ancestry) should have a 2hr 75gOGTT early in the pregnancy to detect early gestational diabetes or type 2 diabetes. If negative, it should be repeated at 26-28 weeks to detect GDM.
- one abnormal 75g OGTT value is a positive diagnosis:
 - fasting ≥ 5.3
 - 1 hour ≥ 10.6
 - 2 hour ≥ 9.0

Blood sugar control in diabetes mellitus and gestational diabetes

Recommended targets for blood sugars:

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|-------------------------------|----------------------|
| - fasting and pre-prandial BG | 3.8-5.2 mmol/L |
| - 1hr postprandial BG | less than 7.8 mmol/L |
| - 2hr postprandial BG | less than 6.7 mmol/L |
| - HgbA1c | $<6.0\%$ |

** HgbA1c is artificially lower in pregnancy due to increase production of new RBCs that have not had time to become glycosylated

Women with pre-existing type 1 or type 2 diabetes

- folic acid 5mg daily should be started before or early in pregnancy to minimize the risk of facial, cardiac and neural tube defects.
- oral anti-hyperglycaemic medications other than metformin should be discontinued prior to conception or as early in pregnancy as possible and management switched to metformin +/- insulin.
- ACEi and statin drugs should be discontinued prior to conception
- There is an increased risk of congenital malformations which is proportional to HbA1c during the first trimester. Therefore optimal blood sugar control BEFORE conception is extremely important. Optimal blood sugar control is a HgbA1c of $\leq 7.0\%$
- HgbA1c measurements should be obtained prior to conception and monthly throughout pregnancy in all pregnant patients with diabetes.
- An ophthalmology exam for retinopathy should be completed pre-conceptually or early in pregnancy and repeated during pregnancy and postpartum at the discretion of the eye specialist.
- A urine albumin-creatinine ratio and serum creatinine should be measured each trimester to screen for nephropathy and OB/Internal Medicine consulted if abnormal.

- Women with type 2 diabetes on metformin prior to pregnancy with good blood sugar control, can avoid insulin treatment if they are attentive to diet and exercise.
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Women with gestational diabetes

- require a referral for dietary advice and lifestyle modifications as soon as they are diagnosed.
 - home glucose monitoring is required to assess control.
 - may require insulin therapy based on blood sugar control.
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Ultrasound assessment and fetal growth/wellbeing

- women with pre-existing diabetes should have a detailed fetal ultrasound with attention to cardiac views to rule out a cardiac anomaly. May want to consider fetal ECHO if cardiac views are sub-optimal and HgbA1c is >8.0% in the first trimester.
 - women with type 1 diabetes mellitus are at elevated risk of fetal growth restriction or macrosomia. They should have a growth ultrasound every 4 weeks from 28 weeks gestation, and an obstetrician should be closely involved in their care.
 - in women with type 2 diabetes mellitus or gestational diabetes, growth should be monitored clinically, and ultrasound should be performed if growth restriction or excess growth is suspected.
 - third trimester assessment for fetal wellbeing starting at 36 weeks with NST +/- BPP should be considered in women with diabetes on insulin therapy who have poor glycemic control.
 - women with well controlled type 2 diabetes or GDM with adequate fetal growth should have monitoring from 40 weeks gestation with NST +/- BPP.
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Treatment of Diabetes in Pregnancy

- women with type 1 diabetes need to continue their insulin regime in close conjunction with their internist or endocrinologist.
 - women with type 2 diabetes on metformin or insulin can continue their regime under the direction of a diabetic educator and/or physician.
 - women diagnosed with gestational diabetes are initially managed with diet and exercise as they begin blood sugar monitoring. If blood sugars remain elevated despite one-two weeks of dietary modifications and exercise, initial management is usually with metformin.
 - women with abnormal renal function should not receive metformin.
 - metformin has many advantages above insulin: oral medication dosed twice daily, better maternal satisfaction, less maternal hypoglycemia, lower maternal weight gain, same neonatal outcomes, lower overall need for insulin.
 - to minimize GI side effects, metformin should be initiated at a low dose (250 mg BID) and titrated slowly - increasing by 250 mg BID every week to a maximum of 1000 mg BID.
 - many women will be able to achieve adequate blood sugar control on metformin alone. Those who do not achieve adequate control or who cannot tolerate metformin will need to be treated with insulin in addition to, or instead of metformin.
 - women with gestational diabetes or type 2 diabetes who require insulin will be cared for by a diabetes team in conjunction with internal medicine specialists as needed.
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Timing of Birth

- many variables determine the option timing of delivery:

- for all women with type 1 diabetes, ongoing specialist obstetrician care is required for 3rd trimester monitoring and determining timing of delivery, sometimes as early as 36-37 weeks.
 - for women with type 2 diabetes or gestational diabetes and poor glycemic control, obstetrical consultation is recommended to determine monitoring and timing of delivery, usually by 39 weeks.
 - for women with well controlled type 2 and gestational diabetes with normal fetal growth, delivery is recommended by 40-41 weeks.
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After Birth

- women with a history of gestational diabetes are at increased risk of type 2 diabetes mellitus and need a 2hr 75g OGTT six to twelve weeks postpartum. They should be screened for diabetes with a 2hr 75g OGTT every 2 years and early in any subsequent pregnancy.
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Maternal Weight Gain in Obese Women and Women with Diabetes

- women with type 1 diabetes should review their dietary and insulin requirements with their internist and maintain this program as much as possible. Most women with type 1 diabetes have a normal BMI >> routine weight gain in pregnancy is recommended
 - obese women (BMI >30), with or without diabetes, should be encouraged to minimize their weight gain in pregnancy while maintaining adequate nutrition, particularly calcium and iron intake. Obese women who limit gestational weight gain have a lower risk of gestational diabetes, gestational hypertension, fetal macrosomia, and operative delivery including c-section. It is desirable for women with a BMI >30 to not gain weight during pregnancy, and if BMI >35, a modest amount of weight loss is permissible.
 - for women unable or unwilling to ingest enough dairy products to provide 1 gram of elemental calcium per day, supplementation with 3 extra strength or ultra Tums per day will suffice. They should not be taken at the same time as prenatal vitamins or iron. Ensure at least 1000 IU of vitamin D intake per day as well.
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Resources

- Canadian Diabetes Association 2013 Clinical Practice Guidelines for Prevention and Management of Diabetes in Canada
- NICE guideline - diabetes in pregnancy: management of diabetes and its complications from preconception to the postnatal period
- Rowan JA et al. Metformin versus insulin for the treatment of gestational diabetes. New England Journal of Medicine 2008
- Kominiarek MA et al. Gestational weight gain and obesity: is 20 pounds too much? American Journal of Obstetrics and Gynecology 2013.
- Kiel DW et al. Gestational weight gain and pregnancy outcomes in obese women. Obstetrics and Gynecology 2007.
- Feldman RK et al. Gestational Diabetes Screening. The International Associated of the Diabetes and Pregnancy Study Groups Compared with Carpenter-Coustan Screening. Obstetrics and Gynecology 2016.
- Landon MB. Changing the Diagnostic Criteria for Gestational Diabetes Mellitus? Obstetrics and Gynecology 2016.