

## **Boston Medical Center Maternity Care Guideline: GESTATIONAL DIABETES TESTING AND TREATMENT**

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### **INTRODUCTION:**

- **Definition:** Gestational Diabetes (GDM) is impaired glucose tolerance with first onset or recognition during pregnancy.
- **Prevalence:** 4.6-9.2% of US pregnancies are affected by GDM. An increased prevalence of GDM is found among Hispanic, African American, Native American, Asian, and Pacific Islander women.<sup>1</sup>
- **Maternal Risk factors for GDM development include:**
  - Personal history of GDM
  - Obesity (BMI $\geq$ 30)
  - PCOS
  - Impaired glucose tolerance
  - Glycosuria early in pregnancy
  - Strong family history of diabetes (one first degree relative, or more than one second degree relative)
  - Previous macrosomic infant.
  - Previous unexplained third trimester loss or neonatal death.
  - Chronic hypertension
- **Maternal/fetal risks of GDM diagnosis:** GDM is associated with significant maternal and neonatal morbidity. **Maternal risks** include development of hypertensive disorders and preeclampsia and development of type 2 diabetes mellitus later in life (50% develop DM within 20years, 60% of Latinas within 5years postpartum).<sup>1</sup> **Neonatal risks** include large for gestational age, macrosomia, shoulder dystocia, stillbirth, and newborn morbidity including hypoglycemia and respiratory distress. Obstetrical risks include risks associated with macrosomia such as increased rate of operative vaginal birth and cesarean section, brachial plexus injury, fracture, and neonatal depression.

### **DIAGNOSIS:**

All pregnant women will be screened for gestational diabetes, with the exception of women who already carry a diagnosis of type 1 or type 2 diabetes. The diagnosis will be based on specific criteria.

### **Early Screening for High Risk Populations:**

Pregnant women who meet the following criteria should be screened as early as possible, preferably at the first prenatal visit. If the initial screening result is normal, they should be re-screened at 24-28 weeks. If the initial screening is elevated with a normal three hour, they should have only the three hour repeated at 24-28 weeks. Indications for early

testing include, but are not limited to:

- Personal history of GDM
- Obesity (BMI $\geq$ 30)
- PCOS
- Impaired glucose tolerance
- Glycosuria early in pregnancy
- Strong family history of diabetes (one first degree relative, or more than one second degree relative)
- Previous macrosomic infant.
- Previous unexplained third trimester loss or neonatal death.
- Chronic hypertension

**Early screening for detection of undiagnosed diabetes:**

- 1 hour GLT (50 gram glucose loading test). If abnormal proceed with 3 hour GTT (100 gram oral glucose tolerance test)
- Draw Hemoglobin A1c at the time of the 3 hour GTT.
- If the 3 hour GTT is normal plan for repeat 3 hour GTT between 24-28 weeks (Omit screening test because it was already abnormal).
- If the patient has abnormal GTT indicating gestational diabetes early in pregnancy, she should be referred to Maternal-Fetal Medicine for prenatal care.
- An HgbA1c  $\geq$  6.5%, the patient should be referred to Maternal Fetal Medicine for prenatal care.

**Late screening**

- Patients should undergo a one hour glucose challenge test no matter what the gestational age at presentation for prenatal care.

**Standard Screening for GDM->Two-step Screening:**

- Pregnant women should be tested between 24-28 weeks (preferably closer to 24 weeks)
- A one hour 50 gm oral glucose tolerance test will be used
- **>135 mg/dl is considered an abnormal test result and requires** a 3 hour 100 gm oral glucose tolerance test (GTT).
- If the **one hour GLT is >185 mg/dl**, then a fasting BG is checked prior to the 3 hour GTT. If the fasting BG is less than 105, then the remainder of the GTT is administered. If the fasting BG is 105 or greater, the rest of the GTT may be cancelled and the patient proceed to treatment of GDM.<sup>2</sup>

- **GTT with 2 out of 4 glucose levels greater than or equal to cutoff value diagnostic for gestational diabetes**

Plasma or serum glucose level

**Carpenter/Coustan criteria**

	mg/dL	mmol/L
<b>Fasting</b>	95	5.3
<b>One hour</b>	180	10.0
<b>Two hours</b>	155	8.6
<b>Three hours</b>	140	7.8

**Testing s/p Bariatric Surgery:**

- Stable patients after gastric banding or gastric sleeve should undergo routine glucose testing as outlined above.
- Patients who have undergone **bypass** surgery including roux-en-Y, jejunioiliac bypass, and any other method **should avoid the glucose load**. Instead of a glucose tolerance test, they **should** undergo fasting and postprandial BS check x1 week between 24-28 weeks gestation. This is also an option for other women who are unable to tolerate a GLT/GTT.<sup>2</sup>

**GESTATIONAL DIABETES TREATMENT AND MANAGEMENT:**

Once the diagnosis is made, the patient will meet with a Registered Nurse for glucometer teaching and scheduled for nutrition consultation.

Glucose levels will be reviewed after one week of following a nutritionally appropriate diet. Target blood glucose (BG) levels are:

- Fasting 70-90 mg/dl
- 140 mg/dl at one hour post prandial
- 120 mg/dl at 2 hours post prandial

**The target level control is 80% of glucose values within appropriate range. This assessment hinges on the acquisition of a reasonable number of BG values per day. Additionally, written diary of BG should be validated against the patient's glucometer.**

If glucose levels are within normal limits, the patient will continue use of the glucometer until the provider feels it is safe to decrease frequency of testing.

If >20% of glucose values are abnormal the patient's care should be transferred to a physician (Generalist OBGYN, Family Medicine, or MFM) for medication management.

**Background to change in recommendations for pharmacologic treatment:**

While prior data had suggested oral hypoglycemic (glyburide, metformin) were reasonable first line agents, the American Congress of Obstetrics and Gynecology (ACOG) now “more strongly endorses” insulin as first line treatment for GDM. This has been the recommendation of the American Diabetes Association for many years. ACOG now recommends that oral agents “be reserved for women who are unwilling or unable to use insulin.” The Society of Maternal Fetal Medicine subsequently issued a statement updating their recommendations for the pharmacologic treatment of gestational diabetes. They cite a large meta-analysis of studies comparing insulin, metformin and glyburide. In it, glyburide was found to be associated with higher birthweight, more frequent macrosomia, and more neonatal hypoglycemic when compared to either metformin or insulin. Metformin has also been associated with decreased gestational weight gain and decreased gestational hypertension in multiple studies. In this and later meta analyses, metformin was found to be on par with insulin and in many studies associated with slightly better perinatal outcomes.

The BMC MFM group has decided to adhere to the recommendations of SMFM: **We advise metformin over glyburide as the oral agent of choice based on superior perinatal and neonatal outcomes. We believe this is a reasonable alternative to insulin as a first line agent.** Based on available data, approximately 50% of women treated with metformin will not be adequately controlled and will ultimately require insulin. We recommend stopping the use of glyburide. **Women already titrated on glyburide with adequate glycemic control may remain on it in the interest of consistency of care.**

**The suggested treatment regimen for metformin is as follows:**

- If BG are elevated both fasting and post meal, start 500mg twice daily with breakfast and dinner.
- If fasting BG are in target range, then once daily dosing with breakfast may be adequate.
- All women should be counseled that some mild GI upset is common in the first days of metformin use and that the majority of cases improve and/or resolve.
- Patients should be seen weekly until adequate glycemic control is achieved.
- If BG control is inadequate, the dose may be increased by increments of 500mg in either daily or twice daily dosing as the glycemic profile dictates up to a maximum of maximum of **2,550 mg/day**. Modest additional benefit has been observed with doses up to ~2,500 mg/day; however, GI adverse effects may limit use (Nathan 2009). **If doses >2,000 mg/day are needed, consider administering in 3 divided doses to minimize GI adverse effects.**
- If the patient’s BG are not adequately controlled on 2550 mg of metformin for two weeks or if metformin is not tolerated, then insulin is recommended . Encourage adherence to nutrition therapy and daily exercise. Patients whose blood glucose cannot be controlled on metformin will be transferred to a Maternal-Fetal Medicine specialist.

**Antenatal testing with GDM:**

- Patients with gestational diabetes requiring medical treatment or without documented good glucose control with diet will begin a regimen of twice weekly **antenatal testing starting at 32 weeks.**
- Send an EPIC message to Yodit Berhane, the practice assistant for the ATU with the update in ultrasound indications for the patient. **This includes if she is already being followed in ATU for GDM but is now newly on medications.** Please include in your communication when the patient’s last ultrasound was so we can time her followup appropriately. We will schedule the ultrasound and reach out to your patient with the time.
- For patients with **target glucose control with diet, testing should begin at 36 weeks.**
- Antenatal testing will include a weekly NST or BPP.
- Twice weekly fetal testing should be considered for patients with **poor glucose control** or noncompliance. The expectation is that the **PROVIDER** is responsible for notifying the antenatal testing unit if twice weekly testing is recommended.

CLINICAL INDICATION	Ultrasound	Start EGA	FREQUENC Y	NST or BPP1	STAR T EGA	FREQUENC Y
<b>DM 1 or 2, on meds (controlled)</b>	EFW	24	Monthly	Yes	32	Twice weekly
<b>DM 2, diet</b>	EFW	24	Monthly	Yes	32	Weekly
<b>GDM, diet</b>	EFW	At dx	Monthly	Yes	36	Weekly
<b>GDM on medication</b>	EFW	At dx	Monthly	Yes	32	Twice weekly

**Timing of Delivery**

- Patients with well-controlled gestational diabetes treated with oral medications or insulin are recommended to undergo induction of labor between 39-40 weeks.
- There are no clear gestational age guidelines regarding induction for women with well-controlled gestational diabetes on diet alone. It is reasonable to induce these patients between 40-41 weeks. An ultrasound for EFW should be obtained at 37-38 weeks gestation for counseling about mode of delivery in the presence of suspected fetal macrosomia (EFW >4500 g at delivery).<sup>3</sup>

All patients will be given educational material that is culturally and linguistically appropriate whenever possible.

**Postpartum Care:**

All patients diagnosed with gestational diabetes will be scheduled for glucose testing at 6 weeks postpartum. The patient’s PCP will be notified of the diagnosis for long-term follow up.

- A 2 hour 75-gram OGTT will be ordered at the routine 6 week postpartum visit.

- The OB care provider will make sure that **Gestational Diabetes** is on the problem list of the patient.
- Both the **patient** and the **patient's PCP** will be informed by the **OB care provider** of an **abnormal** result of the 2 hour 75-gram OGTT.
- The patient should be referred back to her PCP for annual HgA1C measurements.

#### **LOGISITCAL PRACTICE FOR BMC AND CHC PROVIDERS:**

- At BMC, send an EPIC message to the contact Thera Wilson, RN (EPIC message) who will schedule the patient for GDM teaching. ATU group in EPIC
- Place order for glucometer, lancets, and test strips
- The patient will be instructed to check fasting glucose levels and 1 or 2 hours after each meal. (tailor to patient, but have it be consistent)
- The patient will be scheduled by the RN to see the nutritionist to discuss nutrition within 2 weeks of diagnosis.
- In CHC it is the provider's responsibility to ensure glucometer teaching and nutritional consultation per the CHC policy. The CHC provider should send ATU referral at time of diagnosis of GDM to plan for antenatal testing going forward.
- If a CHC provider identifies early GDM, it is the responsibility of the CHC to communicate the diagnosis to the patient, supply a glucometer and accessories and teach how to collect finger sticks so that she presents to MFM with information about her glycemic control.

#### **REFEREBCES:**

- 1 ACOG. Practice Bulletin No. 137: Gestational Diabetes Mellitus (updated). *Obstet Gynecol.* 2017; 130:e17-31.
- 2 SMFM Statement: Pharmacological treatment of gestational diabetes. SMFM Publications Committee.
- 3 Farrar D, Simmonds M, Bryant M, et al. Treatments for gestational diabetes: a systematic review and meta-analysis. *BMJ Open.* 2017. Jun 24 7(6):e015557.
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- 5 Atilano L, Lee-Parritz A, Lieberman E, Cohen AP, Barbieri RL. Alternative methods of diagnosing gestational diabetes mellitus. *Am J Obstet Gynecol* 1999;181:1158-61.)
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- 7 Witkop CT, Neale D, Wilson LM, Bass EB, Nicholson WK. Active compared with expectant management in women with gestational diabetes: a systematic review. *Obstet Gynecol* 2009; 113:206-217.