

# Gestational Diabetes Mellitus

Family Medicine has this covered

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# Gestational Diabetes Mellitus Epidemiology

Family Medicine has this.

- **Gestational Diabetes Mellitus (GDM) is defined as**

# Gestational Diabetes Mellitus Epidemiology

Family Medicine has this.

- **Gestational Diabetes Mellitus (GDM) is defined as**

A condition of glucose intolerance with onset or first recognition in pregnancy that is not clearly overt diabetes.

Normal pregnancy is characterized by pancreatic B-cell hyperplasia resulting in higher fasting and postprandial insulin levels while placental hormones lead to increased insulin resistance

GDM occurs when B-cell function is insufficient to overcome insulin resistance.

# Gestational Diabetes Mellitus Epidemiology

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- **Gestational Diabetes Mellitus (GDM) is common**

# Gestational Diabetes Mellitus Epidemiology

Family Medicine has this.

- **Gestational Diabetes Mellitus (GDM) is common**

Approximately 6% of pregnancies in the US are affected

Range of 1-25% depending on the population

Prevalence is increasing

# Gestational Diabetes Mellitus Epidemiology

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- **Gestational Diabetes Mellitus (GDM) Risk Factors**

# Gestational Diabetes Mellitus Epidemiology

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- **Gestational Diabetes Mellitus (GDM) Risk Factors**

GDM in prior pregnancy

BMI >25 kg per m<sup>2</sup>

DM in 1<sup>st</sup> degree relative

Weight gain of more than 11 lbs since 18 years of age

Ethnicities including Asian, Black, Hispanic, Native American, and Pacific Islander

# Gestational Diabetes Mellitus Epidemiology

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- **Adverse Outcomes for Fetus Associated with GDM**

# Gestational Diabetes Mellitus Epidemiology

Family Medicine has this.

- **Adverse Outcomes for Fetus Associated with GDM**

Subsequent development of DM

Gestational HTN

Preeclampsia

Cesarian Section

# Gestational Diabetes Mellitus Screening

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- How and when in pregnancy is screening recommended?

# Gestational Diabetes Mellitus Screening

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- US Preventive Task Force in process of updating its 2014 guidelines on screening
- Current recommendations include screening after 24 weeks
- Most clinicians use a two step approach
  - First screen with 50 gm non-fasting oral glucose challenge test at 24-28 weeks
  - If this test is positive, then do 100 gm fasting test (3 hr GTT)
- Can use a one-step approach and administer only 75-gm two hour fasting oral glucose tolerance test.

# Gestational Diabetes Mellitus Screening

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GDM is diagnosed when .....

# Gestational Diabetes Mellitus Screening

Family Medicine has this.

GDM is diagnosed when the 3 hr GTT is abnormal which is defined as:

FBS > 95 mg/dL or

Two elevated 100 g three hour oral glucose tolerance test values

# Gestational Diabetes Mellitus Screening

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Some experts have suggested medical nutrition therapy for women who do not meet GTT criteria for GDM but have:

FBS > 90 mg/dL or

One elevated 100 g three hour oral glucose tolerance test value

This is based on some data to support a continuous relationship between glucose concentration and fetal growth/adverse fetal outcome even in women not meeting the ADA criteria for diagnosing DM.

# Gestational Diabetes Mellitus Benefits of Treatment

Family Medicine has this.

- **Benefits of Treatment**

# Gestational Diabetes Mellitus

## Benefits of Treatment

Family Medicine has this.

- **Benefits of Treatment**

US Preventive Task Force made these recommendations based on its 2013 systematic review and meta-analysis of randomized trials finding that the appropriate management of GDM resulted in reductions in:

- Preeclampsia
- Birth weight >4000 g
- Shoulder dystocia

# Gestational Diabetes Mellitus Benefits of Treatment

Family Medicine has this.

- **Benefits of Treatment**

In one of the largest single trials of GDM treatment, randomizing 1000 women with GDM to no treatment or to intervention with lifestyle modifications, blood glucose self-monitoring, and insulin therapy if needed found improved outcomes in:

**Infant death**

**Shoulder dystocia**

**Bone fracture**

**Nerve palsy**

# Gestational Diabetes Mellitus Benefits of Treatment

Family Medicine has this.

- **Benefits of Treatment**

**A more recent meta-analysis found treatment of GDM resulted in a statistically significant decrease in the incidence of preeclampsia, shoulder dystocia, and macrosomia.**

# Gestational Diabetes Mellitus Treatment

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- **What is the initial approach once a diagnosis of GDM has been made?**

# Gestational Diabetes Mellitus Treatment

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- **Glucose monitoring**

**At the time diagnosis, glucose monitoring should begin and include**

**-Fasting glucose levels**

**-One or two hour post prandial levels**

# Gestational Diabetes Mellitus Treatment

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- **Glucose monitoring**

**Goal levels:**

- Fasting glucose levels < 95 mgs per dL
- One hour post prandial level < 140
- Two hour post prandial level < 120

# Gestational Diabetes Mellitus Treatment

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- Lifestyle changes recommended and supported by data?

# Gestational Diabetes Mellitus Treatment

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- **Lifestyle Changes**
  - Individual nutrition counseling recommending carbohydrates being restricted to 40% of calories with proteins at 20% and fats at 40% - but no high quality data on optimal diet exists to date
  - Inconsistent results on effects of exercise on women with GDM but currently recommendations include 30 min of exercise most days per week.
  - Maternal obesity, excess gestational weight gain, and GDM are independent and additive risk factors for macrosomia and caesarian delivery.
  - An elevated blood glucose level despite lifestyle modification is an indication for pharmacologic therapy. The # of abnormal glucose levels needed before initiation of insulin is not well established.

# Gestational Diabetes Mellitus Treatment

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- **Lifestyle Changes**
  - A key intervention in diet would be to recommend the elimination of consumption of sugar-sweetened beverages like soft drinks and fruit drinks with the substitution of drinking water instead.
  - This intervention alone can reduce glucose levels in a matter of days

What about non-caloric sweeteners?

# Gestational Diabetes Mellitus Treatment

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- **Lifestyle Changes**
  - Non-caloric sweeteners such as aspartame and sucralose may be used in moderation.
  - Saccharine is not recommended in pregnancy because it is known to cross the placenta

# Gestational Diabetes Mellitus Treatment

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- **Lifestyle Changes**
    - Elevated blood glucose levels despite lifestyle modification is an indication for pharmacologic therapy.
- What are the cut off values for blood sugar monitoring that call for switch to pharmacologic therapy?**

# Gestational Diabetes Mellitus Treatment

Family Medicine has this.

- **Lifestyle Changes**
  - FBS above 95
  - 1hr pp above 140
  - 2 hr pp above 120

# Gestational Diabetes Mellitus Treatment

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- **What is the preferred pharmacologic therapy for GDM?**

# Gestational Diabetes Mellitus Treatment

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- **Insulin is the preferred treatment when pharmacologic treatment of GDM is indicated.**
- In women who decline insulin or in women who the obstetrical provider believe will not be able to safely administer insulin, Metformin is a reasonable alternative.
- Metformin and glyburide are used but have not been approved by the FDA for use in pregnancy. Both cross the placenta but have not been associated with birth defects or short term adverse neonatal outcomes.
- The US Food and Drug Administration (FDA) places **metformin** in category B: 'Animal reproduction studies **have** failed to demonstrate a risk to the fetus, and there **are** no adequate and well-controlled studies in **pregnant** women

# Gestational Diabetes Mellitus Treatment

Family Medicine has this.

- **Insulin is the preferred treatment when pharmacologic treatment of GDM is indicated.**
- **While Glyburide is often the most commonly used medication in GDM, Some argue Glyburide should not be recommended as a first line pharmacologic treatment of GDM.**
- US FDA pregnancy category C: Animal reproduction studies have shown an adverse effect on the fetus and there are no adequate and well-controlled studies in humans, but potential benefits may warrant use of the drug in pregnant women despite potential risks.

# Gestational Diabetes Mellitus Treatment

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## **Insulin Therapy**

Where to begin?

# Gestational Diabetes Mellitus Treatment

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## Insulin Therapy

- Rapid, Intermediate, and Long-acting all considered safe in pregnancy and do not cross the placenta
- Total daily dose of 0.7-1.0 units per kg
  - Half the total dose as a single dose of long-acting insulin like Glargine (Lantus) or Detemir (Levemir)
  - Other half as three divided doses at mealtimes as rapid acting insulin like Lispro (Humalog) or Aspart (Novolog)

# Gestational Diabetes Mellitus Fetal Assessment

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- **No consensus on optimal approach to fetal surveillance in pregnancies complicated by GDM.**

# Gestational Diabetes Mellitus Fetal Assessment

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- What is the consensus on optimal approach to fetal surveillance in pregnancies complicated by GDM?

# Gestational Diabetes Mellitus Fetal Assessment

Family Medicine has this.

- No consensus on optimal approach to fetal surveillance in pregnancies complicated by GDM.
- **Antenatal testing with GDM controlled without medication is not indicated.**
- For women who require medication for GDM, could consider twice weekly nonstress tests or weekly modified BPP beginning at 32-34 weeks GA

# Gestational Diabetes Mellitus Timing of Delivery

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- Many physicians offer induction of labor between 39-40 weeks although there is no evidence to support the practice.

# Gestational Diabetes Mellitus Postpartum

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- Are there any recommendations for after delivery in women with GDM?

# Gestational Diabetes Mellitus Postpartum

Family Medicine has this.

- GDM is a significant risk factor for the development of GDM in future pregnancies, type 2 DM, type 1 DM, metabolic syndrome, and cardiovascular disease.
- In high risk populations, diabetes develops in up to 50% of women with GDM.
- Breast feeding may reduce the subsequent risk of developing Type 2 DM in women with GDM.
- Women with GDM should be screened for diabetes with a two-hour 75 g GTT at 4-12 weeks post partum and then every 3 years.

# Gestational Diabetes Mellitus Postpartum

Family Medicine has this.

- **If Family Medicine does not have this, who does??**

# Gestational Diabetes Mellitus

## References

- References

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