Currently 7-14% of pregnancies are complicated by gestational diabetes. Prevalence in the US has increased in the last decade.\textsuperscript{11}

Gestational diabetes (GDM) is defined as poor or abnormal glucose tolerance during pregnancy.

Diagnosis of Gestational diabetes means that the body poorly regulates insulin during pregnancy.

Pregnancy is a special time when the body makes more insulin however, if the body does not make enough insulin to keep blood sugar at appropriate levels, the woman gets high blood sugar which is called gestational diabetes.\textsuperscript{8}

**Diagnosis of GDM requires a glucose tolerance test.**

In recent years gestational diabetes was diagnosed during the 24-28 week mark in the pregnancy to coincide with the rise in insulin antagonist hormone levels. However, experts now recommend that women receive a risk assessment on their first prenatal visit.\textsuperscript{1}

Current diagnostic criteria of GDM are at least one plasma glucose at or above 92 mg/dl fasting, 180 mg/dl at 1 hour or 153 mg/dl at 2 hours after a 75 g Oral Glucose Tolerance Test administered by the clinic.\textsuperscript{4} Impaired glucose tolerance measured by this test can also be a predictor for GDM.

Risk factors for GDM:
- overweight status
- maternal age
- family history of type 2 diabetes
- African American, American Indian and Hispanic/Latina\textsuperscript{3}

What is the pathophysiology of gestational diabetes?

Type 2 diabetes is the most common type of gestational diabetes. Patients are thought to have a pancreatic B-cell defect which can result from genetic variants among other things. In gestational diabetes, B cells compensate inadequately for insulin resistance during pregnancy.\textsuperscript{1}
Important Research Challenges

• **Screening for pre-diabetes and diabetes in planning visits.** Current screening techniques fail to capture about 1/3 of GDM. Research into universal screening procedures in early pregnancy may improve prognosis for mother and newborn.

A high prevalence of adverse outcomes in women with hyperglycemia without a GDM diagnosis is an area for further research and possible point of treatment and prevention.2,14

• **A greater focus on the basic care level.** Self monitoring and self care can reduce unnecessary hospital visits. In addition, studies which test lifestyle modifications and pharmacotherapy are needed to address the risk for developing type 2 diabetes after a pregnancy with GDM.10

• **Impact and cost effectiveness of innovative interventions to reduce GDM risk.** Integration of GDM care with current maternal and child healthcare including weight loss and breast feeding visits are possible area of saving for the health care system.14

### Financial impact on the individual and the community.

56% or $355 million of GDM attributed medical costs were paid for by private insurers in 2007.6 The government paid an estimated 36% and the remaining 8% was incurred by self-pay patients. During this time, experts attributed about $3,305 in fees per woman with GDM and about $209 per newborn delivered by a mother with GDM. These figures suggest that GDM is associated with about 1% of all pregnancy related and neonatal related costs. Costs associated with increased time off from work and school were not included in these measurements.

Significant costs associated with GDM include the cost of increased rates of hospital inpatient days for preeclampsia, cesarean delivery and hypertension as related to the mothers. A similar increase in inpatient days was associated with newborns born to mothers with gestational diabetes. Further there is a statistically significant increase in newborn ambulatory visits for affects of labor on the new born and birthweight above the ninetieth percentile, which is a risk associated with gestational diabetes.7

### Health Implications for Mother and Child as a result of GDM13

#### MATERNAL RISKS OF GDM

- Preeclampsia
- Increase in Cesarian Section Delivery
- Increased risk for Type 2 diabetes after delivery
- Infection
- Polyhyramnios

#### FETAL RISKS OF GDM

- Hypoglycemia
- Jaundice
- Macrosomia (Large for gestational age)
- Respiratory distress syndrome
- Increased risk of cardiovascular disease
### Practical Implications for Employers

#### Prenatal Screening

Employers should work with their insurance plans to support GDM screening for women of childbearing age during pre-pregnancy OB/GYN appointments. Therefore, risks can be addressed before pregnancy occurs.\(^\text{14}\)

#### Active Environment

Pregnant employees should have access to walking paths and physical activity during their work day to improve glucose tolerance and reduce sedentary behavior.\(^\text{12}\)

#### Avoid Junk Food Incentives

Employers should reduce the amount of high sugar, high fat foods served to employees in meetings and vending machines around the office. A written healthy food policy is a good way to support balanced meals and reduce the risk of GDM.\(^\text{12}\)

#### Support Breastfeeding

Even short duration of breastfeeding improves long term glucose management and may reduce the child’s risk of type 2 diabetes. Designate private breastfeeding rooms at the office.\(^\text{1,4}\)

### Clinicians role in reducing high risk pregnancy

**The role of the clinician includes assessment of glucose tolerance, counseling on individual risk factors and referral to resources as needed.**

#### Preventive Treatment for Gestational Diabetes

Numerous studies suggest that reduction in body fat with lifestyle modification have the strongest effect in slowing disease progression.\(^\text{4}\)

Lifestyle interventions reduce the risk of other chronic diseases and have no side effects. Therefore clinicians should guide their patients through these modifications and counsel them on their risk of developing gestational diabetes.\(^\text{12}\)

#### Risk of GDM in 2nd Pregnancy

It has been reported that women with GDM in their first pregnancy have a 13 fold risk of experiencing GDM risk in their 2nd pregnancy. However, in 2012, Kaiser found that women who reduce their BMI between pregnancies have a lower risk of GDM in subsequent pregnancies.\(^\text{9}\) Women with prior GDM should be advised to risk of birth defects if conceiving while hypoglycemic.\(^\text{4}\) In some cases Progestin only contraception has been associated with risk of diabetes. Clinicians should be aware of these risks.\(^\text{4}\)
Reducing Risk After Delivery

**Long Term Risk of Type -2 Diabetes**

The first postpartum appointment after a women with GDM delivers is a key time to screen for diabetes. Continued monitoring should occur at one year if postpartum glucose levels are abnormal. If no abnormal levels are detected then the American Diabetes Association recommends testing again three years after delivery. An alternative method would be to monitor A1C levels annually and track whether the levels are trending up indicating the need for intervention before diabetes develops.4 Years of research have documented the increased risk of developing type-2 diabetes following a gestational diabetes diagnosis. In some cases a seven fold increase in risk was documented as compared to risk of developing type 2 diabetes in women without GDM. 10 Risk factors for developing type-2 diabetes long term include continued impaired glucose tolerance, HDL cholesterol lower than 50 mg/dl and age greater than 35.10

Dietary management with healthful eating patterns such as the reduce the risk of developing type-2 diabetes again partly related to the reduction in BMI.1

Pharmacologic intervention to reduce the risk of type 2 DM in women with previous history are Metformin has proven an effective agent.4