About Gestational Diabetes

Gestational diabetes is a type of diabetes that can develop in women during pregnancy. According to the American Diabetes Association (ADA), about 4 percent of all pregnant women have gestational diabetes. The ADA estimates that 135,000 women are diagnosed with this condition every year in the United States. If a woman develops high glucose (blood sugar) during her pregnancy and has never had diabetes before, she has gestational diabetes.

As with other diabetes, gestational diabetes affects the way the body handles glucose. In a normal body, the pancreas produces a hormone called insulin. Insulin helps transport glucose, the body's primary energy source, to the cells. With adequate production and efficient use of insulin, the body is able to function normally. When there is a lack of insulin or it is not being used correctly by the body, the glucose is unable to reach the cells. The glucose remains in the bloodstream, and the result is high blood sugar or diabetes.

With gestational diabetes, the pancreas works extra hard but it still does not make enough insulin. Without adequate insulin, the body is unable to get the necessary nutrients from the glucose in the blood. Scientists have several theories as to why insulin does not work effectively in woman with gestational diabetes. Most scientists believe the condition is related to the extra hormones produced in pregnancy and their damaging effect on insulin.

Gestational diabetes can cause numerous problems for the mother during pregnancy. Women with this condition have a greater chance of developing preeclampsia, a potentially serious condition in which high blood pressure occurs during pregnancy. It can cause fluid buildup and swelling (edema) of the arms and legs. Preeclampsia is dangerous for the mother and the fetus, and in many cases the woman must be placed on bed rest until delivery.

Gestational diabetes also can cause some conditions in the fetus. However, it usually affects women late in the pregnancy rather than the critical first trimester. By the time the woman develops the condition, the baby's body has been formed and is in the growing stage. If left untreated, however, gestational diabetes can cause other problems with the fetus.

The most common problem as the result of gestational diabetes is a condition called macrosomia, or a larger-than-normal baby. For a full–term pregnancy, this means a birth weight over 9 pounds, 14 ounces. According to the ADA, macrosomia occurs two to three times more often in diabetic pregnancies than in the pregnancies in the general population.

Macrosomia occurs because of high blood glucose in the mother. The glucose passes from the mother to the placenta, which in turn goes to the fetus. This causes the fetus' pancreas

to make more insulin to eliminate the extra glucose. The fetus is now getting more fuel than it needs to develop, and it stores the extra glucose as fat.

Macrosomia creates problems for the baby and the mother during delivery. The baby may suffer injuries during birth because of its large size. If the baby is too big, it may not be able to be delivered vaginally. Because of the risk of fetal macrosomia, women with diabetes are three to four times more likely to have Caesarean section delivery.

There is also an increased risk of premature delivery in women with gestational diabetes. This early delivery puts the baby at higher risk for respiratory problems because the lungs are among the last organs to develop.

Gestational diabetes can also cause problems for the baby after delivery. Prior to birth, the fetus produces an increased amount of insulin to handle the mother's high blood glucose levels. At birth, the higher insulin may cause the baby to have hypoglycemia (low blood sugar). The baby's blood glucose level should be checked regularly after birth. If necessary, the baby may need early feeding or intravenous glucose to raise the blood glucose level.

Babies born to mothers with gestational diabetes have an increased risk of developing *jaundice* after birth. Jaundice is a yellowish discoloration of the skin and eyes that occurs when *bilirubin* in present in the blood. Bilirubin is a substance that is released when extra blood cells cannot be processed in the liver and build up in the blood. Jaundice usually appears within the first few days of life but sometimes may not appear until a week after birth. It can be treated by exposing the baby to special lights that remove the pigment. Although jaundice is generally not a serious condition, it should be monitored by the baby's physician.

Children of mothers with gestational diabetes are at higher risk for *Respiratory Distress Syndrome*, a condition that makes it difficult for the baby to breathe. It can be treated in the hospital by supplying the baby with extra oxygen for several days to weeks depending on the severity of the disease.

Having gestational diabetes places the mother and baby at higher risk for certain problems later in life. The ADA estimates that two-thirds of women with gestational diabetes will develop the condition in subsequent pregnancies and that 40 percent of women with gestational diabetes who are obese prior to the pregnancy develop type 2 diabetes within four years. Several recent studies show that a growing proportion of women with gestational diabetes are later developing type 2 diabetes, mostly because of the obesity epidemic. The chance of developing type 2 diabetes is lower in women who are not overweight.

In addition, women with gestational diabetes may be at higher risk of heart conditions and other complications. For example, recent research suggests that women with gestational diabetes are more likely to have a stroke one day

For the baby, gestational diabetes increases the chance of developing diabetes in the future. Babies with excessive insulin become children who are at risk for obesity and adults who are at risk for type 2 diabetes. It is important that these children adopt a healthy lifestyle early in life to help prevent diabetes.

Gestational diabetes is considered a temporary condition. Once the baby is born and the placenta hormones are removed from the bloodstream, the glucose levels usually return to normal. The woman may require regular testing after the birth of the baby to be sure the glucose levels are in control. With a healthy diet, normal weight and controlled blood glucose levels, the woman can greatly reduce chances of further complications from gestational diabetes

Potential causes of Gestational Diabetes

There is no single cause for gestational diabetes. Scientists believe there may be several factors that contribute to high glucose (blood sugar) in pregnant women. The most common theory involves the production of hormones and their effect on insulin.

During pregnancy, the fetus is supported by the placenta, an organ that supplies the fetus with nutrients. The placenta produces hormones, such as estrogen, that help the baby develop. These hormones may also interfere with the mother's insulin in her body. The hormones appear to block cells, making it harder for the glucose to reach the body. This condition, known as insulin resistance, contributes to the cause of gestational diabetes.

Insulin resistance usually begins midway in the pregnancy, around 20 to 24 weeks. As the placenta grows, it produces more hormones, which cause greater insulin resistance.

In most pregnant women, the pancreas is able to produce more insulin, about three times the normal amount. This increased insulin is necessary to overcome the insulin resistance caused by the higher level of hormones. In some women, however, the pancreas is unable to make enough insulin. When the pancreas produces as much insulin as possible and it is still not enough to overcome the effect of the placenta's hormones, gestational diabetes is the result.

Any woman can develop gestational diabetes, but certain women are at higher risk. Factors that increase the chance of developing the condition include:

- Being overweight before becoming pregnant
- Being a member of certain ethnic groups (e.g., Black, Hispanic, Native American, Asian, Pacific Islander)
- Being over age 25
- Family history of diabetes
- Evidence of pre-diabetes (impaired glucose tolerance)
- Having gestational diabetes in a previous pregnancy
- Previously giving birth to a stillborn baby or baby over 9 pounds
- Having too much amniotic fluid (*polyhydramnios*)

Having glucose in the urine (glucosuria)
Polycystic Ovarian Syndrome

Genetics appears to play several roles in the development of gestational diabetes. Scientists have recently found that a certain variant of a gene called the *calpain-10 gene* leads to gestational diabetes. In addition, several studies have suggested that short women may be more likely to develop gestational diabetes

Signs and Symptoms of Gestational Diabetes

In most women, there may be no symptoms of gestational diabetes. Some women may experience symptoms similar to those seen with type 2 diabetes. These symptoms may include:

Increased thirst (polydipsia)
More frequent urination (polyuria)
Unexplained weight loss despite increased appetite (polyphagia) Fatigue, weakness or shaking
Nausea or vomiting
Blurred vision
Yeast infections or other infections

Many of these symptoms are common during pregnancy, such as fatigue and frequent urination. For that reason, women may not recognize the symptoms as an indication of gestational diabetes. For additional information on symptoms, see Type 2 Diabetes.

Another sign of possible gestational diabetes is glucose in the urine (glycosuria). Physicians perform routine urine tests during prenatal visits. If the urine shows sign of glucose, it may indicate gestational diabetes. Ketones, which can be found in urine as well, may indicate inadequate insulin or hyperglycemia, an excess buildup of glucose in the blood. These conditions are associated with gestational diabetes. Glucose and ketones can be detected with a simple urine test

Diagnosis Methods for Gestational Diabetes

Most women are screened for gestational diabetes during their pregnancy. If a woman is under age 25 and has no risk factors for the disorder, she may not be tested for the condition. Otherwise, women are screened at different times during the pregnancy based on their risk level.

A woman is considered high risk if she is overweight or obese, has had gestational diabetes before, or has a family history of diabetes. These women may be checked for gestational diabetes at the first prenatal visit. If the results are normal, the women are usually checked again between weeks 24 and 28 of the pregnancy. A woman is considered low risk if she does not have any of the factors and might not be checked at all unless her condition changes during the pregnancy.

Women may have one or more of the following glucose tests to diagnose gestational diabetes:

Fasting Plasma Glucose Test (FPG). A sample of blood is taken from a vein after the woman has not had anything to eat or drink (except water) for eight to 10 hours. The blood is tested for the amount of glucose (sugar) that is present in the sample. If the glucose level is 126 milligrams per deciliter (mg/dL) or higher on two occasions, the woman may be diagnosed with gestational diabetes.

Random Plasma Glucose Test (RPGT). A sample of blood is taken from a vein and tested for the amount of glucose present in the blood. This is not done after fasting so the glucose in the blood may be high. However, the level should be less than 200 mg/dL. If the level is 200 mg/dL or higher on two occasions, the woman is considered to have gestational diabetes.

*Glucose Challenge Tes*t. For this screening test, the woman drinks a sugary beverage (50 grams of glucose) and the blood is checked an hour later. This test may be done at any time during the day. If the glucose level is over 140 mg/dL, the results are considered positive (abnormal). Not all women with a positive screening test have diabetes.

Oral Glucose Tolerance Test (OGTT). This test is more sensitive than the FPG test and can often detect milder cases of diabetes. It measures blood glucose levels four or five times over a three–hour period. Prior to the test, the woman must not eat or drink anything but water for eight to 10 hours. Before starting the test, a blood sample is taken to provide a fasting blood glucose level. The woman drinks a sugary beverage (100 grams of glucose) and blood samples are taken every hour for three hours. Blood glucose levels are obtained from these samples and compared to normal levels.

According to the American Diabetes Association (ADA), these levels represent the criteria for diagnosing gestational diabetes:

Above–Normal Results for OGTT (100-gram glucose load)	
Fasting	95 or higher
At one hour	180 or higher
At two hours	155 or higher
At three hours	140 or higher

If glucose levels are above normal at least twice during the test, gestational diabetes is diagnosed. The OGTT is usually done between the second and third trimester of pregnancy when the greatest amount of insulin resistance occurs.

The fasting plasma test and random plasma test are often administered as the first test to check for gestational diabetes. However, these tests may not detect gestational diabetes in all women. Most physicians rely on additional tests to confirm the diagnosis.

It is important to remember that having a high glucose level on the glucose screening test does not necessarily mean the woman has gestational diabetes. For a clear diagnosis, the glucose tolerance test must show abnormal levels of blood glucose.

In addition to having these diagnostic tests, women who have gestational diabetes may undergo a glucose monitoring test called the fructosamine test. This blood test assesses glucose control over the past several weeks. It may be used in place of the glycohemoglobin test, which assesses glucose control over the past several months. Patients may also be advised to have fetal monitoring tests such as ultrasound.

According to some scientists, diagnosis of gestational diabetes can be more accurate using ultrasound to measure the midsection of a fetus, instead of relying on maternal glucose tests. These researchers propose administering insulin not to all hyperglycemic pregnant women but rather to those whose fetus has an abdominal size in the 75th percentile or higher. However, this diagnostic and treatment protocol is not standard.

Treatment options for Gestational Diabetes

Because gestational diabetes can harm the mother and the fetus, early treatment is crucial. The goal of treatment is to maintain glucose (blood sugar) levels equal to those of pregnant women without gestational diabetes. A plan is designed to help the woman keep glucose levels in control. This treatment plan usually includes:

Healthy Diet

Eating the right types of food during pregnancy is important for the health of the mother and the fetus. In women with gestational diabetes, a healthy diet is even more crucial for managing glucose levels. A meal plan may be developed by a:

Physician
Registered dietician
Nutritionist
Certified diabetes educator

In general, the diet should contain foods that are high in nutrients and low in fat and calories. A recommended diet usually includes:

More fruits and vegetables
More whole-grain breads and cereals
Foods high in protein
Foods low in saturated fat and trans fat
Less sugar and sweet foods

No single diet is right for every woman. A knowledgeable team of medical professionals can design the correct diet based on the woman's glucose level, activity level and weight.

Exercise

Physical activity is strongly linked to lowering blood glucose by helping to

Move sugar from the blood to cells of the body
Lower the body's sensitivity to insulin
Use less insulin to transport blood glucose

· In addition to helping control glucose, exercise may relieve some of the discomforts associated with pregnancy. It can help lessen back pain, muscle cramps and difficulty sleeping. In addition, exercise helps prepare the woman for labor and delivery.

As with all exercise, the woman should consult with her physician before beginning an exercise program. The recommendation from professionals is usually a minimum of 30 minutes of aerobic exercise a day. For the best results, the aerobic exercise should be combined with stretching and strengthening activities. Once cleared by a physician, the woman should exercise consistently to help lower her glucose levels.

Medication

In some women with gestational diabetes, diet and exercise are not enough to control glucose levels. These women may need to take daily medication to help lower blood glucose to a safe level. Insulin, which is injected into the body, is used rather than anti-diabetic agents.

Insulin does not cross the placenta and will not harm the fetus. The safety of anti-diabetic agents during pregnancy has not been fully established, although certain sulfonylureas may at times be prescribed. Because it is not clear whether these pills can harm the fetus, they are not commonly prescribed for use. A physician will determine the need for medication and the best type suited for the woman's condition. In addition, women with gestational diabetes are advised to check the urine for ketones. Ketones are byproducts produced when the body burns fat for energy instead of glucose. High levels may be dangerous. Ketones are tested by using a special strip to check a urine sample.

Once a woman has had gestational diabetes, a blood test should be performed annually to check for high blood glucose (hyperglycemia). In addition, recent research suggests that a blood test showing high levels of the amino acid homocysteine six weeks after delivery can help predict which cases of gestational diabetes are more likely to develop into type 2 diabetes. The physicians at Diabetic Consultants of Alaska recommend a repeat glucose tolerance test at 12 weeks post partum.

Prevention of Gestational Diabetes

Although all pregnant women can develop gestational diabetes, some women are at higher risk for the condition. Many of the factors cannot be controlled, such as race, family history of diabetes or previous complicated pregnancies. Other factors, such as weight and glucose control prior to pregnancy, can be controlled.

Being overweight or obese prior to pregnancy is one of the leading causes of gestational diabetes in women. Frequently, the higher weight is associated with high blood glucose (hyperglycemia). Although these women may not have diabetes, they may have pre-diabetes, a condition closely linked to gestational diabetes. With pre-diabetes, the blood glucose level is higher than normal but not high enough to be diagnosed as diabetes.

The best way to prevent gestational diabetes is to have a healthy body weight and normal blood glucose prior to becoming pregnant. Medical professionals advise women who are overweight to reach a healthy body weight before pregnancy. In addition, glucose should be at a controlled, safe level. There is a much better chance of a having a normal pregnancy without gestational diabetes if the mother is healthy and active before becoming pregnant.

In addition, research has shown that regular exercise reduces the risk of gestation diabetes

Please consult with your obstetrician regarding the information above