

A Guide to Gestational Diabetes



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This educational material was developed by a team of women's healthcare experts throughout UPMC, including Magee-Womens Hospital, one of the first National Centers of Excellence for women's health as designated by the U.S. Department of Health and Human Services.

A Guide to Gestational Diabetes

This booklet by no means replaces the treatment that you should seek from your health care team. Diabetes and pregnancy require a program of treatment individualized to you and your baby.

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What is gestational diabetes?

Gestational diabetes is glucose intolerance that is diagnosed between 24 and 28 weeks of pregnancy. Glucose intolerance means a problem in the body's usual process for changing food into energy. Normally, the pancreas makes insulin that carries the food energy to the cells. The extra energy (glucose, or "sugar") is stored in muscle, liver, and fat cells.

When you're pregnant, the placenta makes hormones that work against the body's insulin. During pregnancy, the body needs three to four times as much insulin as it usually does. In gestational diabetes, the body's insulin supply cannot keep up with the need. The extra glucose (sugar) stays in the blood and crosses the placenta to the baby.

Ninety-eight out of 100 women who get gestational diabetes will not have diabetes after delivery. However, some may get diabetes later in life.

Who gets gestational diabetes?

Gestational diabetes occurs in about 15 percent of all pregnancies. Your chances of developing gestational diabetes are greater if you:

- have a family history of diabetes
- are overweight
- have had a baby weighing more than 9 pounds at birth
- have had a stillbirth
- are of an ethnic origin at increased risk for Type 2 diabetes, such as Native American, African American, or Hispanic

However, gestational diabetes can occur even with no risk factors.

How is gestational diabetes diagnosed?

It is important to detect and treat gestational diabetes early so that the developing baby is not affected. If you are at high risk for developing gestational diabetes, you will be tested early in pregnancy. If the early test is negative, then you will be tested again between 24 and 28 weeks of pregnancy. Women who are not high risk will take a 1-hour glucose test between 24 and 28 weeks of pregnancy. You will be given a sweet liquid called glucola to drink. One hour later, a blood sample will be drawn to test the level of glucose in your blood.

If the blood glucose is 135mg/dl or more, then a 3-hour glucose tolerance test will be done.

The 3-Hour Glucose Tolerance Test

A fasting blood sample is taken first. Then a more concentrated amount of glucola is given to you to drink. A blood sample then is drawn each hour for 3 hours. Your blood glucose numbers should be:

After fasting: Less than 95

One hour after drinking glucola: Less than 180

Two hours after drinking glucola: Less than 155

Three hours after drinking glucola: Less than 140

If 2 or more of your numbers are high, then a diagnosis of gestational diabetes is made.

Risks of gestational diabetes to the mother

Most women with gestational diabetes have normal labors and deliveries. Others may need special treatment during pregnancy.

- Some women may have longer than average labors.
- Some women may have kidney, bladder, or vaginal infections.
- Some women may develop too much amniotic fluid (the fluid surrounding the baby), which can increase the risk of early labor.
- Some women may have early or premature labor caused by overstretching of the uterus from a large baby or too much amniotic fluid.

- Some women are at increased risk for:
 - pre-eclampsia
 - needing a cesarean section (C-section)
 - developing Type 2 diabetes later in life

Risks of gestational diabetes to the baby

Most babies born to mothers with gestational diabetes do fine. Others may need special treatment.

Large Birth Weight (Macrosomia)

By 26 weeks of pregnancy, the baby's pancreas is working. The mother's glucose crosses the placenta to the baby.

The baby then makes large amounts of insulin to lower its blood glucose. The extra is deposited on the baby as body fat. This causes the baby to gain extra weight.

Newborn Hypoglycemia (Low Blood Glucose)

The pancreas makes extra amounts of insulin during the pregnancy. It is hard for it to stop right after birth. The baby may have these signs and symptoms of low blood sugar for several hours to a few days after birth.

- unusually quiet
- sluggish or sleepy
- breathing slowly
- bluish tint to the skin (cyanosis)
- fast heart beat

If you have gestational diabetes, we will test your baby's blood soon after birth. When blood glucose is less than 40mg/dl, the baby goes to the neonatal intensive care nursery. The baby is given glucose through an IV. When blood glucose is 40 to 60 mg/dl, the baby goes to a regular nursery, where hourly blood tests are done and early feeding starts. The feedings are either sugar water, breast milk, or formula.

Jaundice (Hyperbilirubinemia)

Jaundice shows up as a yellowing of the baby's skin. Sometimes the whites of the eyes are yellow. Jaundice means that the liver is not working normally. This is seen more often in premature infants (infants born more than three weeks before the due date). Babies with jaundice get treatments with special lights (photo therapy).

How is gestational diabetes treated?

Treatment starts with diet and exercise. In some cases, medication either in pill form or injectable insulin may be added to your treatment plan. Many women need to monitor their blood glucose levels on a regular schedule using a blood glucose meter.

Meter Testing

You will have a blood glucose meter prescribed. Use it at home to monitor your blood sugars throughout the day.

You need to check your blood glucose as often as your doctor or diabetes educator tells you to. Most women check their blood sugars in the morning before eating (fasting) and 1 hour after each meal. A normal fasting blood glucose level is less than 90 mg/dl. A normal blood glucose level checked 1 hour after a meal is less than 140 mg/dl. Your medication if any, will depend on your glucose levels.

Diet

A balanced meal plan is an important part of the treatment plan. You will meet with the nutritionist. She will teach you about a meal plan to fit the special needs of your pregnancy. The nutritionist will be available to see you for follow-up visits.

For some women, diet is all that is needed to control diabetes. For others, medication must be used along with diet. Your doctor will talk with you about treatment options.

Exercise

Regular physical exercise is an important part of your treatment plan. Discuss your exercise regimen with your health care provider before you start.

Medications

The developing fetus and the hormones that the placenta make may cause the mother to need more insulin during pregnancy. If you need medication for your diabetes, the first treatment choice is glyburide. Glyburide is a pill used to lower your blood sugar levels. Glyburide may be taken once or twice a day depending on your blood sugar levels. There is a maximum dose of glyburide.

If you can not achieve acceptable blood glucose levels with glyburide, you will be changed to insulin.

Insulin action

Insulin is given by injection (shot) and is measured in units. Your doctor, nurse, or diabetes educator will show you how to give the injection. Always check twice to make sure the amount in the syringe is right. Too much or too little insulin can cause your blood glucose to be too low or too high.

Insulin injection sites

The areas where insulin may be given are the upper outer arm, the front and outer side of the thigh, and select areas of the stomach. Your nurse will show you. Injection sites are changed every day. If a hard raised area (lump) appears, stop using that site. If you use it, the insulin cannot be used correctly by the body.

Common types of insulin

Human Insulin (Humulin/Novolin): Insulin made in the lab that is identical to the insulin produced in the pancreas. This may work quickly or more slowly, depending on the type that your doctor orders.

Humalog: Clear liquid. Rapid-acting, begins working 15 minutes after injection. It works best in 30 to 90 minutes. It is given at the start of meals.

Regular: Clear liquid. Fast-acting begins working 30 minutes after injection. It works best in 2 to 4 hours. It is given 30 minutes before a meal.

NPH: Cloudy liquid. Works slowly, begins to work 2 hours after injection. Works for 8 to 24 hours. It works best for 6 to 12 hours after injection.

Lantus: Clear liquid. Begins to work 2 to 4 hours after injection. Works for 24 hours. Gives continuous insulin action.

Most women take 3 or more injections each day. Regular and NPH may be mixed. Humalog also may be mixed with NPH. **Lantus cannot be mixed with other insulin.** Your doctor will write specific orders for the insulin you will take.

Hypoglycemia — low blood sugar

Low blood sugar, or hypoglycemia, happens when there's too much insulin in your blood. This can happen because of:

- skipped meal or snack
- delay in meal or snack
- not enough to eat
- increase in physical activity
- injecting too much insulin

Signs and Symptoms of Hypoglycemia

- shakiness
- tremors
- sweating
- numbness around the mouth
- headache
- flushed face
- confusion
- changes in mood

- sleepiness
- hunger
- restless sleep or nightmares

Symptoms can come on quickly. At the first sign of symptoms, begin treatment and check your blood glucose if possible.

Treatment of Hypoglycemia

The hormones that cause signs and symptoms of hypoglycemia may be decreased during pregnancy. You may or may not be aware of the signs and symptoms. When you check your blood and the glucose reading is less than 60, treat it as hypoglycemia even if you do not have symptoms. **Right away, eat or drink something sweet, such as:**

- 4 ounces of fruit juice
- 3 glucose tablets (chew these)
- 1 tablespoon of sugar
- 3 graham crackers
- 8 ounces of skim milk
- 4 to 6 ounces of a soft drink (regular pop)
- or eat your next meal or snack

Wait 10 to 15 minutes. If you are still having symptoms, check your blood glucose again. If your blood glucose is still low, repeat the treatment. If you are unable to check your blood glucose and are still having symptoms, repeat the treatment.

Testing that may be done

Throughout your pregnancy, testing will be done to check the growth, development, and well-being of you and your baby.

Ultrasound or sonogram: Sound waves are used to get a picture of the baby. This test does not use radiation.

Purpose: To check growth and development of the baby and to see the exact location of the placenta.

Procedure: A lubricating jelly is put on the mother's abdomen. A sensing device is moved over the abdomen to locate the fetus, and a picture is taken.

Multiple marker screening: There are 4 substances found in the mother's blood that come from the fetus, the placenta, or both.

Purpose: To check for rare birth defects of the brain and spinal cord; for example, Down syndrome and spina bifida.

Procedure: A blood test is done at 15 to 19 weeks of pregnancy to measure levels of alpha-fetoprotein, human chorionic gonadotropin, unconjugated estradiol, and inhibin A.

Nonstress test: A sensitive microphone is used to measure and monitor fetal heart rate.

Purpose: To check the health of the unborn baby.

Procedure: A sensing device is placed on the mother's abdomen, and the heart rate is monitored with the baby's movements. The fetal heart rate should increase when the baby moves.

Biophysical profile: The baby is observed using ultrasound.

Purpose: To check the health of the unborn baby when nonstress test results are not normal or not satisfactory.

Procedure: The baby's movements, muscle tone, amniotic fluid levels, and breathing are monitored using ultrasound.

Amniocentesis: A sample of the fluid around the baby is taken and checked.

Purpose: To measure chemicals in the amniotic fluid (the fluid around the baby) for the maturity of the baby's lungs. Lung maturity is needed so the baby can breathe outside the mother's body.

Procedure: A needle is placed into the abdomen as an ultrasound is being done. About a half-ounce of fluid is collected for testing.

Hemoglobin A1C: A blood test that may be done to measure the mother's blood glucose level over the past 2 to 3 months.

Having your baby

Delivery usually occurs between 37 and 40 weeks of pregnancy. Timing depends on fetal weight, lung maturity, blood glucose control, and health of the mother. An amniocentesis may be done to measure lung maturity. If the lungs are mature, then delivery is scheduled.

Types of Delivery

Vaginal spontaneous: A vaginal spontaneous labor occurs when labor begins on its own.

Vaginal induction: Labor is induced with a drug (usually Pitocin). Pitocin causes contractions of the uterus and dilation of the cervix in preparation for delivery. Sometimes a gel or suppository called Prostin is used to soften the cervix. Induction may need to be tried more than once.

Cesarean section: A cesarean section (C-section) may be done when induction does not work or problems occur during labor, or if the baby is too large to be delivered vaginally.

Day of Delivery

If you are scheduled for an induction or a cesarean section, please check with your doctor as to what to eat and what your medication dose should be the day you come into the hospital. Your blood sugar will be checked during labor.

Postpartum period

After delivery, you should not require insulin and can return to your normal diet. It is important to have a 2-hour 75 gram glucose tolerance test done 6 weeks after delivery to be sure the gestational diabetes is gone.

Diabetes will return in 30 to 50 percent of later pregnancies and can appear later on in life. You need to have regular medical checkups to make sure that diabetes is detected early and treatment is started promptly.