

# Diabetes in Pregnancy

Diabetes is a disorder in which the body doesn't produce enough insulin ( a hormone made by the pancreas that lets the body turn blood sugar into energy or store it as fat), or can't use insulin properly. In untreated diabetes, high levels of sugar can accumulate in the blood and damage organs, including blood vessels, nerves, eyes and kidneys. Some people with diabetes need daily insulin injections to prevent these complications.

About 1 in 100 women of childbearing age has diabetes before pregnancy (preexisting diabetes). Another 2-5% develop diabetes during pregnancy (gestational diabetes). Today, most of these women can look forward to having a healthy baby. While diabetes poses some risks in pregnancy, advances in care have greatly improved the outlook for these pregnancies.

Q: What risks does diabetes pose to the baby?

A: Women with poorly controlled preexisting diabetes in the early weeks of pregnancy are 2-4 times more likely than non-diabetic women to have a baby with a serious birth defect, such as a heart defect or neural tube defect (NTD) (a birth defect of the brain or spinal cord). They also are increased risk of miscarriage and stillbirth. Women with gestational diabetes, which generally develops later in pregnancy, usually do not have an increased risk of having a baby with a birth defect. However, some studies suggest that, if a woman's gestational diabetes is severe enough to require treatment with insulin, her baby may be at increased risk of birth defects. Some of these women may have had unrecognized diabetes that began prior to pregnancy. They may have had high blood sugar in the early weeks of pregnancy, which increased the risk of birth defects.

Poorly controlled gestational diabetes also slightly increases the risk of stillbirth. However, with improvements in medical care, stillbirth is rare.

Women with poorly controlled diabetes (gestation or preexisting) are at increased risk of having a very large baby (10 pounds or more). Macrosomia is the medical term for this. These babies grow so large because some of the extra sugar in the mother's blood crosses the placenta and goes to the fetus. The fetus then produces extra insulin, which helps it process the sugar and store it as fat. The fat tends to accumulate around the shoulders and trunk, sometimes making these babies difficult to deliver vaginally and putting them at risk for injuries during delivery.

During the newborn period, babies of all women with poorly controlled diabetes are at increased risk of breathing difficulties, low blood sugar levels and jaundice. These problems can be treated, but it's better to prevent them by controlling blood sugar levels during pregnancy. Babies of women with gestational diabetes also may be at increased risk of developing obesity and diabetes as young adults.

Q: Does diabetes cause other pregnancy complications?

A: With advances in medical care, women with diabetes are almost as likely as women without diabetes to have an uncomplicated pregnancy and a healthy baby, as long as blood sugar levels are well controlled beginning before pregnancy. However, women with poorly controlled diabetes, especially preexisting diabetes, are at increased risk of certain pregnancy complications. These increased miscarriage; pregnancy-related high blood pressure; polyhydramnios (excess amniotic fluid, which can contribute to preterm labor); preterm delivery; and stillbirth.

Q: What tests are recommended to detect complications?

A: The doctor will carefully track the size and well being of the fetus, especially during the third trimester of pregnancy. He or she may recommend one or more ultrasound examinations to assure that the fetus is growing at a normal rate. If the baby reaches a weight of 9 pounds, 14 ounces or more, the doctor will likely recommend a cesarean deliver at term. The doctor also may recommend a “nonstress test” which may be repeated weekly or more frequently, a procedure that monitors the baby’s heart rate. In most cases, these tests will show that the pregnancy is progressing normally. Although women with diabetes are at increased risk of cesarean delivery, most have normal vaginal deliveries.

Q: Why is pre-pregnancy care crucial for women with diabetes?

A: Women with preexisting diabetes should consult their doctors before pregnancy to ensure that their blood sugar levels are well controlled. This is important because the most serious birth defects associated with diabetes originate in the early weeks of pregnancy, before a woman may realize she is pregnant.

Studies have shown that blood sugar control begun before pregnancy largely eliminates the extra risk of birth defects for women with preexisting diabetes requiring insulin. Studies also show that blood sugar control before and during pregnancy reduces the risk of miscarriage, stillbirth, macrosomia and complications in the newborn period.

When a woman with diabetes plans to conceive, doctors often recommend a monthly blood test that measures glycated hemoglobin (a substance formed when glucose in the blood attaches to the protein in the red blood cells). This test shows how well blood sugar has been controlled during the past two to three months. It can help determine when it is safest to try to conceive. The test also may be used to monitor blood sugar control during pregnancy.

All women should take a multivitamin containing 400 micrograms of the B vitamin folic acid, as part of a healthy diet, starting at least one month before pregnancy, to help prevent NTS. Women with preexisting diabetes are at increased risk of having a baby with an NTD, so taking folic acid may be especially crucial for them. At a preconception visit, women with diabetes should ask their doctors whether they should take a daily dose of folic acid greater than

400 micrograms. While there are no studies on the use of such larger doses of folic acid to prevent NTDs in women with preexisting diabetes, doses of 4,000 micrograms have proven successful in reducing the risk of having another baby with an NTD in women who already have had an affected baby.

Women with preexisting diabetes who take oral medications to control their blood sugar levels will need to switch to insulin before conceiving and during pregnancy, as the oral medications may pose a risk of birth defects.

Q: What are the symptoms of gestational diabetes and how is it detected?

A: Gestational diabetes is one of the most common pregnancy complications. It usually develops during the second half of pregnancy, when hormones or other factors interfere with the body's ability to use its insulin. Most women with gestational diabetes have no symptoms, although some may experience extreme thirst, hunger or fatigue. Blood sugar levels generally return to normal after delivery.

Women at increased risk of gestational diabetes include: those who are over age 30; are obese; have a family history of diabetes; or have had a very large (over 9 lb) baby or a stillborn baby. According to the Centers for Disease Control and Prevention (CDC) gestational diabetes occur more frequently in African-Americans, Hispanic/Latino Americans, Pacific Islanders and American Indians than in other groups.

Most pregnant women are screened for gestational diabetes between the 26-28<sup>th</sup> week of pregnancy. Women who are considered high risk (including women who have had gestational diabetes in a previous pregnancy) often are screened at an early prenatal visit and, if test results are normal, screened again at 26-28<sup>th</sup> weeks. According to the American Diabetes Association (ADA), women under 25 years of age, who have no other risk factors for diabetes, do not require screening because they have a very low risk of the disorder. The test involves taking a blood sample one hour after consuming a drink of 50 grams of glucose (a form of sugar). Women with high blood levels of glucose will take the similar, though longer, glucose tolerance test, which involves drawing blood samples one, two and three hours after drinking 100 grams of glucose.

Once gestational diabetes is diagnosed, most women can control their blood sugar levels with diet and exercise.

Q: What diet is recommended for pregnant women with diabetes?

A: A pregnant women with either form of diabetes should follow a diet designed especially for her. Most women with gestational diabetes are referred to dietitians for this. A woman with preexisting diabetes should already be following a special diet, but she also should get nutritional counseling, as her diet may need modifications as her pregnancy progresses.

How many calories a pregnant woman with diabetes should eat, and the proportion of foods from the various food groups, (i.e., fat, carbohydrates, proteins, dairy, fruits, and vegetables), depends upon many factors, including weight, stage of pregnancy and baby's rate of growth. Her doctor and dietitian use these factors, as well as her food preferences, in designing a diet.

As a very general rule, a pregnant woman with diabetes (gestational or preexisting) who is of average weight should consume 2,200 to 2,400 calories a day. This should help her gain the recommended 25-35 pounds during pregnancy. For women with gestational diabetes, this is divided among three meals and a bedtime snack. Women with preexisting insulin dependent diabetes often are advised to eat 1-2 additional snacks. The dietitian will recommend a diet that probably will include 10-20% of calories from protein (meat, poultry, fish, legumes); about 30% from fats (with less than 10% from saturated fats); and the remainder of calories from carbohydrates (bread, cereal, pasta, rice, fruits, and vegetables). A woman with diabetes also should limit sweets.

Q: Should a pregnant woman with diabetes exercise?

A: Exercise can help control diabetes by prompting the body to use insulin more efficiently, and is recommended for most women with gestation diabetes and some women with preexisting diabetes. However, pregnant women with diabetes always should talk to their doctors about exercising. Pregnant women with poorly controlled diabetes or certain complications, such as high blood pressure or blood vessel damage (caused by preexisting diabetes), should exercise only upon the advice of their health care provider.

Q: Do pregnant women with diabetes require insulin treatment?

A: Many women with preexisting diabetes require insulin injections to keep blood sugar levels under control. Insulin requirements change during pregnancy, generally increasing after 20-24 weeks and stabilizing about 36 weeks.

Only about 10-15% of women with gestational diabetes require insulin treatment. Insulin is recommended for the remainder of the pregnancy if blood sugar levels do not stabilize after two weeks on a special diet. However, a recent study found that women with gestational diabetes who were treated with an oral diabetes medication called glyburide did not have an increased risk of having a baby with birth defects, compared to a similar group of women treated with insulin. Women treated with the oral medication also did not have more pregnancy complications than did women in the insulin-treated group. If results of this study are confirmed, women with gestational diabetes that can't be controlled by diet eventually may be able to take a pill instead of insulin injections. (Because the women in the study received the drug after the first trimester, the study does not demonstrate whether or not treatment would be safer for women with preexisting diabetes, who require treatment early in pregnancy.)

Q: How can a pregnant woman monitor her diabetes at home?

A: Pregnant women who need insulin should monitor their blood sugar levels several times a day. Many providers also advise this for women with gestational diabetes controlled by diet. Blood glucose meters or colored strips used with finger stick devices make it easy to check blood sugar levels and adjust insulin dosage between prenatal visits.

The doctor may suggest a home urine test to measure levels of ketones, weak acids produced when diabetes is poorly controlled and the body burns fat instead of blood sugar for energy. Moderate to large amounts of ketones in the urine can be a sign of ketoacidosis, a complication that, unless promptly treated, can lead to death of the fetus.

Q: Do women with diabetes require special care after deliver?

A: Some women with preexisting diabetes find that their blood sugar levels may be more difficult to predict in the weeks after delivery. This is especially true if a woman is breastfeeding. Women with preexisting diabetes should monitor their blood sugar levels frequently, so that they and their doctors can adjust their insulin dose.

After delivery, blood sugar levels return to normal for most women with gestational diabetes. The ADA recommends that women who had gestational diabetes have their blood sugar levels checked 6 weeks after delivery to make sure sugar levels are normal. Women who have had gestational diabetes have about a 50% chance of developing diabetes in the future, so the ADA also recommends a blood sugar check every three years. These women can help reduce their risk by starting a weight loss and exercise program after delivery. They also face about a 50% risk of gestational diabetes in another pregnancy. A recent study suggests that weight loss between pregnancies also may reduce this risk.

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