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## Diabetes and Pregnancy

The information below will help you determine if diabetes during pregnancy represents an increased fetal risk. With every pregnancy, all women have a 3 to 5 percent chance to have a baby with a birth defect.

### What is diabetes?

Diabetes is a condition in which the body either does not produce enough insulin or cannot use insulin properly. Insulin is a naturally occurring hormone in the blood that is necessary for providing our cells with energy to function. Insulin helps sugar (glucose) move from the bloodstream into the cells. When glucose cannot enter our cells, it builds up in the blood (hyperglycemia). This can lead to damage of organs including the eyes and kidneys, or damage of blood vessels and nerves.

Most people with diabetes have “Type 2 diabetes,” which means that the body does not produce enough insulin or the insulin is not able to transfer glucose into cells. Type 2 diabetes used to be known as adult-onset diabetes. In contrast, people with “Type 1 diabetes” (previously called juvenile-onset diabetes) have a condition where the body does not produce any insulin at all. People with Type 1 diabetes need insulin injections and close monitoring to control their blood sugar levels.

### I have diabetes and am planning on getting pregnant. Is there anything I need to know?

It is recommended that women with diabetes speak with their doctors *before* becoming pregnant. This will help ensure that their blood glucose levels are under control. Whether a mother’s diabetes increases the chance of birth defects is based on how well her glucose is controlled just before and during a pregnancy. This is true no matter what the cause of the diabetes. Studies have shown that women who have well-controlled diabetes before becoming pregnant and who maintain low glucose levels throughout pregnancy are not at increased risk for having a baby born with birth defects. A blood test measuring the levels of Hemoglobin A1C (glycosated hemoglobin) estimates glucose control for the previous 2-3 months. Ideally, this level should be within the normal range *before* pregnancy. Some doctors will recommend additional home blood glucose testing to check the sugar levels more regularly. Women with diabetes should also work with their doctors and nutritionists to develop a personalized diet and exercise plan before pregnancy.

### Does maternal diabetes cause birth defects?

It is important to remember that most babies born to women with diabetes are not born with birth defects. However, high glucose levels during pregnancy increase the chance that a baby will be born with birth defects. High glucose levels have the most significant effect early in pregnancy, possibly before a woman knows she is pregnant. For pregnant women with poor diabetic control, the risk for a baby to be born with birth defects is about 6-10%; this is about twice the chance for birth defects if the mother’s diabetes is well controlled. For those with extremely poor control in the first trimester, there may be up to a 20% risk for birth defects. Some of the associated birth defects include spinal cord defects (spina bifida), heart defects, skeletal defects, and defects in the urinary, reproductive, and digestive systems. Finally, babies born to women with diabetes also have an increased chance of having breathing difficulties, low blood sugar (hypoglycemia) and jaundice (yellowish skin) at birth.

### Does having diabetes lead to any pregnancy complications?

Women with diabetes are generally followed more closely in pregnancy because of the potential for certain complications. When glucose levels are not in good control, there is also an increased risk for miscarriage and stillbirth. There is also a higher chance of pre-eclampsia (high blood pressure, swelling, and protein in the urine), pre-term delivery and excess amniotic fluid around the baby (polyhydramnios). Finally, mothers with diabetes are more likely to have large babies, some weighing over 10 pounds. When this occurs, the doctor may advise the woman to deliver the baby by cesarean section rather than by vaginal delivery in order to reduce the risk of injuries to the mother and baby. Chances for these complications are lower when women have good glycemic control.

### What kinds of tests are recommended during pregnancy for women with diabetes?

There are several tests that can be done during a pregnancy to evaluate how the baby is growing and

developing. An ultrasound, which uses sound waves to create a picture of the baby, can be used to look at different structures of the baby and to make sure the baby is growing at a normal rate. A fetal echocardiogram can be used to evaluate whether the baby's heart is developing properly. Non-stress tests can be used to monitor the baby's heart rate. A test of maternal blood (called the AFP test or triple screen) measures certain proteins the baby makes that cross into the mother's blood. The levels of these proteins can give information on a baby's chances to have certain birth defects such as spina bifida.

### **I have to take insulin injections for my diabetes. Does insulin have any effects on the baby?**

Animal, human or synthetic insulin may be used for glucose control during pregnancy. Several studies have shown that using insulin during pregnancy is not associated with an increased risk for birth defects. It is thought that the potential benefits of using insulin to regulate glucose outweigh the risks of insulin use, since better glucose control can reduce the risks of birth defects associated with poorly controlled diabetes.

### **If I am taking oral medications to control my diabetes, will I have to switch to insulin injections during pregnancy?**

Since insulin is thought to control glucose levels better than most oral medications, your physician may want you to switch to insulin injections. There have been studies comparing birth defect rates of babies from women who control their diabetes with insulin injections with those who take oral medications to lower glucose in their blood. In general, taking oral medications does not increase the risk that a baby will be born with birth defects. It is important to recognize that there may be more specific information available for different medications. Consult with your physician regarding which medication may be appropriate for you.

### **I am 26 weeks pregnant and was told I have gestational diabetes. Is this the same as Type 1 or Type 2 diabetes and will this affect my baby?**

Of all the women who have diabetes during pregnancy, 90% have gestational diabetes. Gestational diabetes is diabetes that is diagnosed during pregnancy, generally between 24-28 weeks. Most pregnant women are screened for gestational diabetes by drinking 50 grams of a glucose solution and measuring their blood glucose level one hour later. If this test is abnormal, additional testing may be done to verify whether a woman really has gestational diabetes. Most women with gestational diabetes do not have symptoms, but some may experience extreme thirst, hunger or fatigue. For most women with gestational diabetes, blood

glucose levels return to normal after pregnancy, although 40% of women with a history of gestational diabetes develop diabetes at some point in the future. Most women with gestational diabetes can control blood glucose levels with dietary changes, while 10-15% may require insulin injections.

Because gestational diabetes typically occurs late in the second trimester when the baby's body is already formed, it does not usually increase the risk of birth defects, but is associated with a chance for delivering a large baby. You should discuss with your doctor whether vaginal delivery or cesarean section is most appropriate given the baby's size. If gestational diabetes is not well controlled, there is an increased chance for the baby to have hypoglycemia and breathing problems at birth.

In rare cases where gestational diabetes is present in the first trimester, there may be a small increased risk for birth defects similar to that seen with other forms of diabetes. It is not clear whether gestational diabetes truly increases these risks, or whether the women in these studies simply had Type 1 diabetes that had not previously been identified.



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