

Pregnancy and Diabetes Session
(for those who had diabetes before they got pregnant)



TOPICS

1. Effects of diabetes on your baby
2. Effects of diabetes and pregnancy on you
3. Keeping you and your baby healthy
4. Insulin and the importance of schedules
5. Blood sugar testing
6. Hypoglycemia
7. When to contact the health care providers
8. Postpartum health

1. Effects of Diabetes on Your Baby

In people with diabetes, there are two main time periods to be aware of during pregnancy - the first trimester (first 3 months) and the last two trimesters (months 4-9). High blood sugars during these two periods have different effects.



High Blood Sugar During the First 3 Months:

If your blood sugars are high during the first 3 months congenital malformations (birth defects) and spontaneous abortions (loss of your baby) are possible problems.

Congenital malformations include heart defects, skeletal problems and problems with the brain and nerves.

Usually 2-3% of pregnancies have a congenital malformation. If blood sugars are high during the first 8 weeks of pregnancy, the incidence of congenital malformations is 6-13%. If blood sugars are very high, rates of defects can be up to 40% (or 4 out of 10 births).

In women with high blood sugars, there is frequently more than 1 defect and the malformations are more severe than in the general population - often resulting in the baby's death.

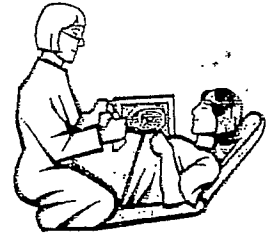
If blood sugar levels are normal to moderately high, the rate of spontaneous abortion (or loss of the baby) is similar to that of the general population. However, as blood sugar levels get higher, the risk of spontaneous abortion goes higher.

Studies have shown that if women get their blood sugar levels normal before becoming pregnant and keep them there for the first trimester, the rate of birth defects and spontaneous abortions are the same as in the general population.

2. Risks of Diabetes and Pregnancy for the Mother

The mother with diabetes may experience some problems including:

1. High blood pressure
2. Infections
3. Preterm delivery
4. C-Section
5. Eye, kidney and heart related problems



There is a strong connection between diabetes and high blood pressure in pregnancy (especially if there are already some blood vessel problems). Some studies have also looked at gum disease and pre-eclampsia (high blood pressure, protein in the urine and edema or swelling). The more gum disease you have, the higher your risk of pre-eclampsia in pregnancy. Pre-eclampsia can progress to eclampsia (coma and convulsions).

In addition to gum disease, other infections are more common in women whose blood sugars are not well controlled.

Preterm deliveries, often from the unborn baby being in distress from lack of oxygen, are more common in women whose blood pressure levels are high.

C-sections (surgery to take out the baby) are higher in women with diabetes, particularly if the baby is over 4500 grams, if the unborn baby is in distress, or if the mother has eye damage (pushing the baby out can cause bleeding in already damaged eyes).

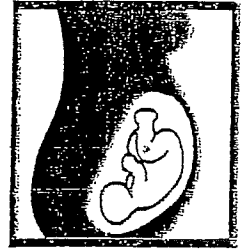
Eye health can get worse during pregnancy - especially if a woman has untreated diabetic eye disease. See an eye specialist before you become pregnant to see how your eyes are doing. Get them checked during and after pregnancy, too.

If a woman has kidney disease, she is at a higher risk of a worsening of any high blood pressure as well as pre-eclampsia. There is also a 10x increase in the number of stillbirths in women with kidney disease. Have your kidneys checked before, during and after pregnancy. Heart disease is 2-4 times more common in women with kidney disease. If a woman has heart disease, there is a high risk of death. Check your heart health before you get pregnant.

High Blood Sugar During the Second and Third Trimesters (4-9 months):

The most common problems are:

1. Macrosomia
2. Stillbirth
3. Low blood sugar
4. Higher rates of obesity, high blood pressure and diabetes



Macrosomia means babies who are abnormally large (macro means big and somic means body). Abnormally large means that the baby weighs over 4 kg at birth if they are full term or that the baby is heavier than normal for their age if they were born prematurely (early).

Macrosomia is the most common problem of diabetes and pregnancy. Some people think bigger babies are healthier babies. This is not true if they are macrosomic.

Macrosomic fetuses need more oxygen in the womb. If there is not enough oxygen, the baby can die. Smoking is very dangerous for pregnant women since it produces carbon monoxide. Carbon monoxide binds the mother's red blood cells making it impossible for them to carry oxygen to the fetus.

Most of the problems from macrosomia relate to difficulties giving birth. The big baby has a hard time passing through the birth canal and may get shoulder injuries.

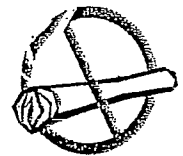
Stillbirth (baby is not alive when it is born) is another problem of diabetes and pregnancy. If blood sugars are kept normal, stillbirth rates go down.

Low blood sugar in the newborn is a common problem. When the mother's blood sugar levels are high during pregnancy, the baby gets too much sugar as well. This makes the baby's pancreas work hard to grow and develop to make insulin. After the baby is delivered and no longer receives sugar from its mother's blood, the baby's pancreas still makes too much insulin. This makes his blood sugar levels go too low after he is born.

Finally, the children of women who have diabetes are at a higher risk of obesity, high blood pressure and diabetes.

3. Keeping You and Your Baby As Healthy As Possible

Here are some general steps you can take to keep yourself and your unborn baby as healthy as possible. More detailed information on healthy eating and physical activity follow.



Plan your pregnancy: Before you get pregnant

- get blood sugars down to normal by eating well and exercising - take insulin if you need to
- stop taking diabetes pills
- take a multivitamin and multimineral with 400 ug of folic acid
- have the doctor check your eyes, heart and kidneys
- If you smoke, drink alcohol or take illegal drugs - stop. Even if it's just for your pregnancy. This sacrifice will help your baby for life.

See your doctor and nurse regularly during pregnancy. Have your blood pressure checked at each visit.

Keep blood sugars normal during pregnancy:

Time	Recommended Blood Sugar Level
Fasting	<5.3
1 hour after eating	<7.8
2 hours after eating	<6.7

Keep checking your blood sugars (fasting and after each meal). If they start going up, see a nurse/doctor right away to see if you should start, or increase, your insulin. If you are on insulin, check your ketones.

Check urine ketones first thing in the morning; if your sugar is above 10; if you are ill or if you are unable to eat. High ketones can affect the unborn baby's brain and, if the mother gets DKA, the unborn baby may die.

Keep weight gain healthy - don't lose weight during pregnancy it can lead to large amounts of ketones.

Pre-pregnancy BMI = $\text{kg}/\text{ht}(\text{in m})^2$	Recommended total weight gain
< 20	28-40 lbs (12.5-18 kg)
20-25	25-35 lbs (11.5-16 kg)
26-30	15-25 lbs (7-11.5 kg)
>30	~15 lbs (6 kg)

For morning sickness:

- have crackers or toast before getting up
- small frequent meals may help
- avoid caffeine (coffee, tea, chocolate, cola)
- avoid fatty foods
- avoid spicy foods
- drink fluids between meals instead of with meals
- take prenatal vitamins at bedtime
- keep your blood sugar normal (low blood sugar can make nausea worse)
- if you are vomiting and taking insulin, see the nurse right away

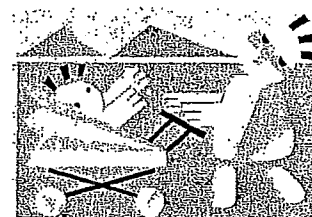
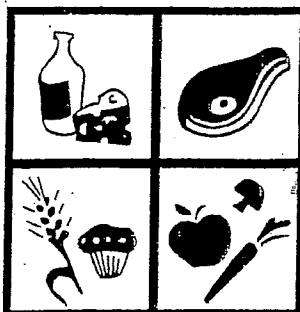
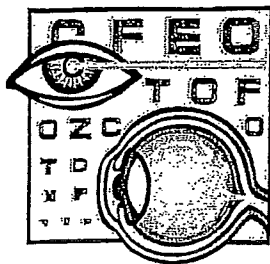


Eat well:

- See a dietitian to develop a personalized plan.
- Eat 5-6 small meals throughout the day including a snack at bedtime.
- Get 3-4 of the different food groups at each meal.
- Get at least 5 fruits and vegetables (e.g. oranges, carrots, romaine lettuce, apples, red peppers) every day. Fruit later on in the day is good if your blood sugars are higher in the morning.
- Try to get a fish dish (e.g. salmon sandwich) at least twice a week.
- Try to get some beans or lentils (e.g. chili; baked beans with little sauce; lentil soup) at least twice a week.
- Take a prenatal vitamin every day.
- Drink 5 glasses of water a day and 3 cups of milk (if you don't drink milk, have yogurt and drink 3 other low sugar drinks) a day.

Be physically active. Walk for 15-20 minutes a day if your blood pressure is fine and the doctor says it is OK. If you get contractions, stop your activity. Don't get dehydrated, overheated or out of breath. Carry additional food in case of low blood sugar.

Have your eyes checked. Pregnancy hormones and high blood pressure can make eye damage worse - get eyes checked before, during and after pregnancy.



4. Taking Insulin

It may seem like taking insulin is a difficult and painful thing to have to do, but here are the facts:



- you CAN learn to do it - thousands do every day
- there are new needles out which are virtually pain-free
- your nursing station nurses and the Sioux Lookout Diabetes Program (1-888-507-7701) are there to help you
- you and your baby will be healthier because of the effort you put in to keeping your blood sugars healthy.

There are a few key points:

- When you are on insulin, keep your physical activity as well as the timing and content of your meals as constant as you can so that you and the nurses/doctor can see your blood sugar patterns. This will help them see if your insulin needs to be adjusted to keep your blood sugars as healthy as possible.
- Use your usual daily routine as the basis for the schedule you develop with the nurse or dietitian with times for meals, snacks, testing and insulin injections.
- While normal levels are your goal, your numbers don't need to be perfect to have a healthy baby.
- You will probably need 3-4 injections each day to reach your goals.
- As your pregnancy progresses, you will probably need higher doses of insulin. By the end of your pregnancy, this dose may be 2-3 times higher than you started with! This is because your pregnancy hormones act against insulin - not because your diabetes is worse.
- It is safe to inject insulin into the belly area.
- Blood sugar monitoring is very important. Make sure your meter is working properly. Ask the nurse to check it against the lab values.
- Know the signs, treatment and prevention of hypoglycemia or low blood sugar (see the next section) and make sure your family and friends know, too.
- Follow-up with the nurses, doctor or diabetes program regularly to make sure everything is on track.

5. Blood Sugar and Urine Ketone Testing

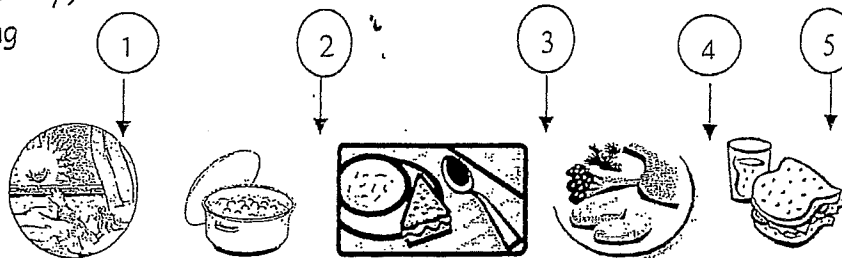
Keep blood sugars normal during pregnancy:

Time	Recommended Blood Sugar Level
Fasting	<5.3
1 hour after eating	<7.8
2 hours after eating	<6.7

Testing times:

If you are not on insulin (5 x/day):

1. First thing in the morning
2. 1 hour after breakfast
3. 1 hour after lunch
4. 1 hour after supper
5. $\frac{1}{2}$ hour before bed



If you are on insulin (7-8 x/day):

1. Before each meal (breakfast, lunch and supper)
2. 1 hour after each meal (breakfast, lunch and supper)
3. before evening snack
4. occasionally at 2-3 am (to make sure you aren't getting low blood sugars at night which can cause high sugar in the morning)
5. to be safe, you must test before each injection and 1 hour after each meal

Times to test more frequently are:

- If you are ill
- If you are under stress
- If you have experienced, or don't get symptoms from, low blood sugar
- If you have introduced a new food, activity or medication

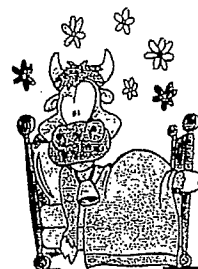
It is important to use your meter/strips properly to get the right results.

- Make sure the strips are not outdated
- Make sure the strips are stored in a tightly sealed container away from heat, cold, light and air
- Make sure there is enough blood on the test strip
- Make sure the code is right
- Make sure your finger is clean and dry
- Make sure the meter is clean and that it's been checked for accuracy
- Call the diabetes program for more information (1-888-507-7701)

Symptoms:

Mild (people can treat themselves) hypoglycemia symptoms might include:

- Sweating
- Trembling, shaking
- Pounding heart, fast pulse
- Change in body temperature
- Heavy breathing
- Tingling in hands and feet
- Difficulty concentrating
- Lightheaded
- Nauseous
- Weak
- Headache
- Hungry
- Feel like something isn't right
- Irritable, anxious
- Blurred vision
- Numbness
- Dizzy



These symptoms usually go away quickly when sugar is consumed. If you feel like you can't do your normal activities properly, you may have low blood sugar.

Severe (needs assistance to treat) hypoglycemia has symptoms such as:

- Thrashing around in bed and moaning while sleeping
- Confusion
- Slurred speech
- Unusual behaviours
- Lethargy (sluggishness)
- Unconscious (pass out)
- Seizures

Since the person can't treat themselves, they need someone else to treat them. Confusion may cause accidents and injuries may result from falling down.



Nursing Station

If blood sugar levels start going up, see a nurse/doctor right away to see if you should start, or increase, your insulin. Check your ketones if your blood sugars go above 10.

Ketones are produced when fat is broken down in your body. This happens when you don't eat enough food or when your body doesn't have enough insulin.

Check urine ketones:

- first thing each morning
- if your sugar is above 10
- if you are ill or
- if you are unable to eat.



High ketones can affect the unborn baby's brain and, if the mother gets DKA (high sugars and high ketones in the blood), the unborn baby may die.

Have the nursing station check your HbA1c monthly. HbA1c is a measure of the amount of sugar attached onto red blood cells. It lets you know how your blood sugars have been in the past 3 months or so since this is as long as red blood cells live. Levels should ideally be in the mid-normal range.



6. Hypoglycemia or Low Blood Sugar

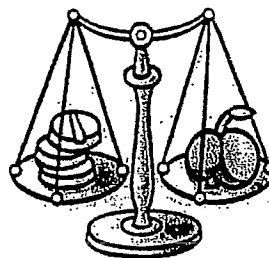
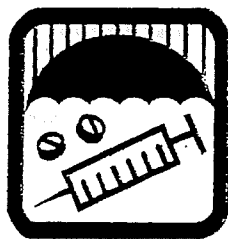
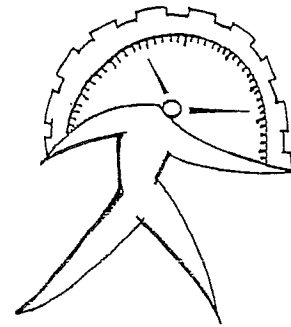
When blood sugars go below 3.9, we say they are low. Low blood sugars may lead to death. It needs to be treated quickly. Survivors of severe hypoglycemia have a risk of permanent brain damage.

Having kidney or liver disease increases the risk of having low blood sugar. So does not eating well and being older.

If you have a low blood sugar reaction, the next one may not give you many symptoms if it happens soon after the first (within a day or so).

Some Causes of Low Blood Sugar:

- Too much insulin
- Not taking insulin on time
- Not eating enough food (or having too much fat and/or not enough starches at your meal)
- Skipping meals or snacks
- Not eating on time
- Not balancing exercise with food and insulin
- Alcohol consumption without enough starch
- Frequent vomiting (e.g. morning sickness)
- The first 3 months of pregnancy (fetus uses a lot of sugar; increased insulin sensitivity)
- Breastfeeding without enough food or with too much insulin
- For non-pregnant people, some diabetes pills can lead to low blood sugar (e.g. glyburide and repaglinide). It is dangerous to take sulfa-type antibiotics if you are taking glyburide (ask your doctor about medication interactions each time you get a new medication)



Preventing Low Blood Sugar:

- Know your insulin, food and activity schedule and stick to it (if you can't, let your nurse, doctor or diabetes educator know so that they can help you set up a better one for you)
- If daytime physical activity was increased, have an extra starch at your nighttime snack.
- Monitor your blood sugars regularly and let your nurse, doctor or diabetes educator know if there are any problems you see (or show them your log book)
- If you cannot eat, take sips of sugar containing beverages (e.g. flat gingerale) over a 4 hour period. (or 2/3 cup of apple juice, 1 cup chicken broth and 1 whole popsicle).

Treating Low Blood Sugar:

- If blood sugar is less than 3.9, eat or drink 10-15 grams of sugar or sugar containing foods/drinks.

10-15 grams of sugar

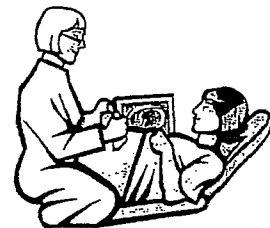
6-8 lifesaver candies
2 tablespoons of raisins
½ cup regular pop (not diet)
½ cup fruit juice
1 cup skim or 1% milk (not higher fat)

- If blood sugar is less than 2.8, have 20-30 grams of sugar or sugar containing foods/drinks.
- Test blood sugar after 15-20 minutes. If it is still low, treat again. If blood sugar levels are low, treat even if the symptoms are gone.
- Eat a meal or snack within the next hour.
- Wait for awhile before starting any dangerous activity (driving, chainsaws, motorboats, etc...)
- Teach your family and friends to recognize low blood sugar and how to treat it. Call the nursing station and let them know what happened.
- Always carry some source of sugar on you.
- Always wear some form of identification such as medic alert
- Mothers need to care for themselves right away if they get low blood sugar.

7. When to Contact the Nursing Station

Contact the nursing station if:

- There is a large change in blood sugar levels
- There are ketones in the urine
- There is vomiting
- There is a low blood sugar reaction
- There is fever, vaginal bleeding, a severe headache or blurred vision
- There is a decrease in fetal movement in the second half of the pregnancy



HIV Testing in Pregnancy

to reduce the risk
of mother - baby
HIV transmission

Mother - Baby Transmission

15 - 30% chance

- ▶ during pregnancy
- ▶ during labour & delivery
- ▶ through breastfeeding

Anti-viral drugs

can reduce the baby's risk to 1% - 8%

- ▶ ideally, mom begins by 14 weeks
- ▶ drugs given IV during labour & delivery
- ▶ baby given syrup for 6 weeks

Why Test?

- ▶ so women can make informed choices about their own health and their baby's health

When to Test

your family doctor can test you

- ▶ ideally, before you are pregnant
- ▶ as soon as you know you are pregnant
- ▶ repeat testing for women with ongoing risk during pregnancy

How to Test

testing remains the woman's decision

- ▶ all pregnant women receive counselling about HIV and testing
- ▶ HIV antibody testing with informed consent
- ▶ counselling about the test result and what it means

Benefits for Women

- ▶ knowing her HIV status allows for choices in health care
- ▶ early treatment of HIV infection delays the onset of symptoms and prolongs life
- ▶ possibility of diagnosis / prevention of secondary cases

Risks for Women

- ▶ emotional effects of waiting for results
- ▶ potential negative response of partner
- ▶ potential negative social consequences

Benefits for Baby

if mother knows HIV status

- ▶ the transmission rate is reduced by
 - prophylactic therapy in pregnancy
 - avoiding breastfeeding
- ▶ early diagnosis in the infant delays the onset of symptoms and prolongs survival
- ▶ use of prophylactic therapy for PCP in newborns significantly reduces morbidity in infants

Risks for Baby

- ▶ use of "new" drugs in pregnancy with little known of the effects on fetal growth
- ▶ labelling of the baby as "sick" even after negative tests
- ▶ potential negative social consequences

Your Role

what you can do to help

- ▶ inform women of the advantages of HIV antibody testing
- ▶ display pamphlets/posters
- ▶ be sensitive to women's fears