



High Blood Pressure During Pregnancy

High blood pressure occurs when the pressure of the blood inside the arteries builds up to levels that are greater than normal. When high blood pressure occurs late in pregnancy, it is called *preeclampsia*. In some women, preeclampsia is mild and blood pressure rises only slightly. In others, blood pressure can rise to extremely high levels and can damage organs such as the kidneys, brain, eyes, and liver in the mother.

Even when a woman has mild preeclampsia, blood flow to the *placenta*, or afterbirth, may decrease, leaving the fetus (the unborn baby) malnourished and underweight. In severe cases, it can be fatal to the mother and the fetus.

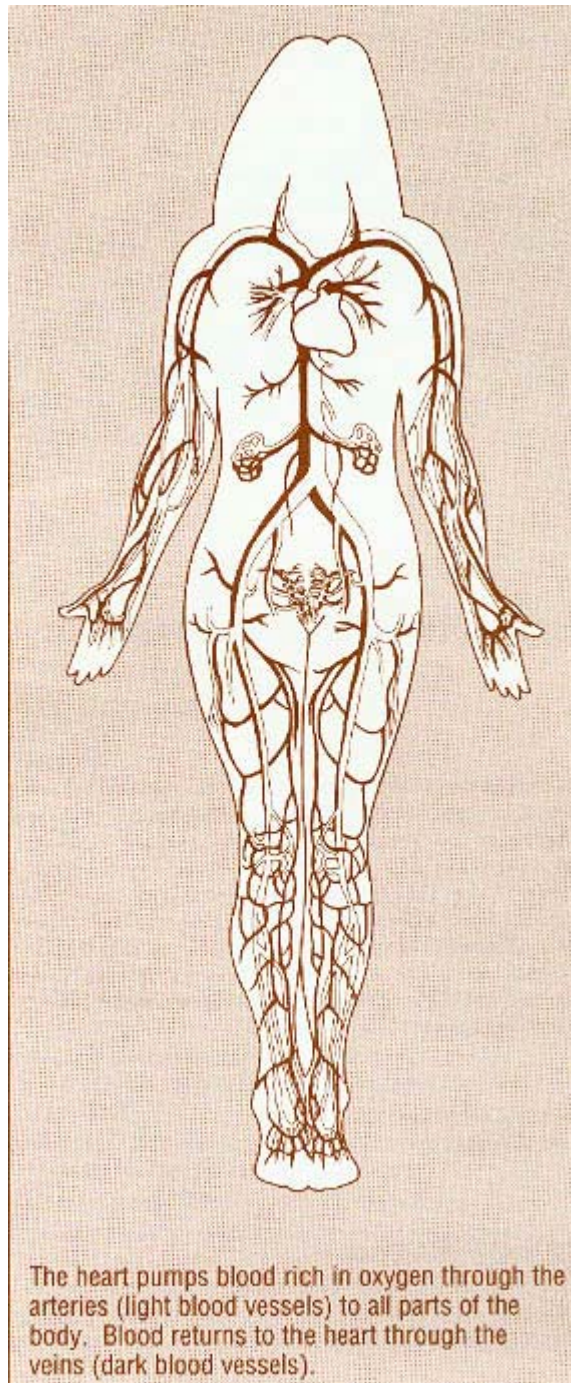
These serious problems may never develop if changes in blood pressure are detected early and efforts are made to protect mother and fetus. The most important thing a woman can do in pregnancy is to see her doctor early and regularly. As part of her prenatal care (care before the baby is born), the woman's blood pressure can be checked to detect high blood pressure.

Although researchers continue to probe for answers to the problem of preeclampsia, no one knows what causes it or why some women get it and others do not. Most of the women who get preeclampsia have never had high blood pressure before-and most will never have it again.

This pamphlet provides information on high blood pressure in pregnancy: what is it, who has a risk of getting it, how it is treated, what you can do to help prevent it. If you plan to become pregnant and have any of the factors that may lead to high blood pressure in pregnancy, you will want to talk this over with your doctor beforehand.

The Circulatory System

The circulatory system is made up of the heart and blood vessels. Some blood vessels, (*arteries*) carry blood to the organs; others (*veins*) carry blood back to the heart. Each time the heart contracts, or squeezes together, it pumps blood rich in oxygen out into the arteries. The major arteries carry blood all over the body, to the head, heart and lungs, abdomen, arms, and legs. These arteries branch into smaller arteries that lead to organs like the kidney, liver, and brain. The small arteries branch into the *arterioles*, the smallest arteries. Blood returns to the heart through the blood vessels called veins.



The heart pumps blood rich in oxygen through the arteries (light blood vessels) to all parts of the body. Blood returns to the heart through the veins (dark blood vessels).

Blood Pressure

Just as there would be no running water in a house if there were no water pressure, the circulatory system could not function if there were no *blood pressure*. The heart supplies some of this pressure when it contracts and forces blood into the arteries. The arterioles also supply pressure. These blood vessels are lined with a layer of muscle. When the blood pressure is normal, this muscle is relaxed and the arterioles are open (dilated) so that blood can flow easily through them. But if a signal is given to increase the blood pressure, the muscle layer tightens and the arteriole closes (constricts). This creates a bottleneck that drives up the blood pressure in the arteries. Imagine that an arteriole is the nozzle on a hose. When it is open, the water can escape, so the pressure in the hose is normal. When it is closed, the water is trapped and the pressure in the hose rises.

Measuring Blood Pressure

Blood pressure is routinely checked with a stethoscope and an instrument made up of an inflatable cuff and a pressure gauge (a sphygmomanometer). If a blood pressure reading is 110/80, 110 is the pressure in the arteries when the heart is contracting. This is called the *systolic pressure*. The lower number, 80 is the pressure in the arteries when the heart is relaxed. This is the *diastolic pressure*.

Blood pressure varies with the age and size of the individual, so everyone's blood pressure is different. Readings between 100/70 and 130/80 are normal for adults. Pressures above 140/90 are considered high.

Blood pressure changes often during the day. It can rise if you are excited or if you exercise vigorously. It will fall if you are resting. These temporary changes in the blood pressure that occur in response to some activity or event are normal. It is only when a person's blood pressure stays high for some time that he or she has high blood pressure.

Because of these normal ups and downs in the blood pressure, if your doctor finds one high reading, he or she will want to see whether or not it is typical of your normal blood pressure by taking another reading at a later time. Your normal blood pressure can be an average of several readings taken at rest.

Women at Risk

High blood pressure during pregnancy—preeclampsia—affects 7 out of every 100 women who become pregnant. It affects most of these women during their first pregnancy. Those who delay their first pregnancy until after age 30 and those who are overweight are more likely to develop high blood pressure in pregnancy. Teenage women who are pregnant for the first time are also especially likely to have this problem.

Women can also develop high blood pressure in a second or third pregnancy. For example, if a woman is diabetic, if she is carrying more than one fetus, or if there is too much water around the fetus in the amniotic sac, she has a higher risk of developing high blood pressure even though this may not be her first pregnancy. High blood pressure in pregnancy is more common in daughters of women who have been affected. Women who have had kidney disease also have an increased risk of high blood pressure in pregnancy.

There is another type of high blood pressure, that affects both women and men, called “chronic high blood pressure.” This problem is long lasting and usually requires treatment with drugs. Women who have chronic high blood pressure can develop preeclampsia, and the combination of the two is very serious. These women are in a high-risk group and should be watched carefully during pregnancy.

A diet low in protein may cause high blood pressure in pregnancy or increase the risk to the fetus and the mother. Most experts agree that high blood pressure in pregnancy happens more often to women who live in areas where there is poverty and a lack of medical care during pregnancy.

Blood pressure During Pregnancy

In the middle part of pregnancy, a woman’s blood pressure normally tends to be low. In the latter part of pregnancy, it returns to its pre-pregnancy level. If a woman did not have high blood pressure before she became pregnant, and there is going to be an increase in blood pressure, it usually occurs after the 28th week of pregnancy.

Because of the changes in blood pressure during pregnancy, the doctor must know what your blood pressure normally is. For this reason, a woman should see her doctor and have her blood pressure measured before she becomes pregnant, or as early as possible in pregnancy. Some blood pressure levels that may seem normal could be too high in a pregnant woman. For instance, doctors would consider a reading of 120/85 to be too high if it were from a pregnant woman whose normal reading was 90/70. As a rule, any increase of 30 or more in the systolic reading, or 15 or more in the diastolic reading, is a sign of high blood pressure in pregnancy.

What Happens in Preeclampsia

The blood vessels in the uterus of a pregnant woman enlarge and dilate so that the blood flow to the placenta is increased. The placenta is a pancake-shaped organ that lies flat up against the wall of the uterus. The mother’s arteries enter on one side of the placenta carrying nutrients and oxygen. These substances pass through a thin membrane and enter the fetal blood through fetal blood vessels. The nutrients leave the other side of the placenta in the umbilical cord and are carried to the fetus. All of the nourishment that the fetus receives during pregnancy comes through the placenta.

In women who are going to develop high blood pressure, the arterioles throughout the body and the arteries of the uterus do not dilate but constrict as if they had received a signal to produce an increase in blood pressure. This reduces the amount of the mother’s blood flowing to the placenta. Because less food and oxygen reach the placenta, the growth of the fetus slows down.

Effects on the Fetus

Preclampsia, if left untreated, may cause a number of problems for the fetus. The fetus may be underweight. The fetus may have to be delivered prematurely. If born early, the baby could be weakened by poor nutrition and a shortage of oxygen. In severe cases, the baby may be stillborn.

When the increase in blood pressure occurs late in pregnancy and the baby is delivered near the 36th week, the newborn is not likely to be affected because the baby is almost fully developed. If preeclampsia is detected in mild stages and the mother's blood pressure is controlled by bed rest and drugs the doctor may prescribe to relax the mother, she can usually expect to have an unaffected baby. In general, if the mother is well nourished, if she follows her doctor's advice about bed rest, and if her blood pressure does not get too high, the fetus should not be adversely affected.

Effects on the Mother

Extremely high levels of blood pressure in the mother that persist without medical care can result in injuries to the organs. Most often affected are the kidneys, brain, eyes, and liver. The heart may be weakened from the stress of pumping out blood against the force that has built up because the arterioles are smaller.

The placenta may tear away from the wall of the uterus (a condition called *abruptio placentae*) before delivery. Although other, sometimes unknown, factors may also cause this condition, it can occur if the blood vessels leading to the placenta are ruptured by high blood pressure and begin to leak blood. The force of this blood behind the placenta may eventually push it away from the uterine wall.

If the blood pressure rises to very high levels and persists, seizures can occur. At this stage, the problem is called *eclampsia*.

Severe cases usually involve women who do not see doctors until late in pregnancy. By this time the blood pressure has already risen to high levels and is harder to control.

Warning Signs

Certain signs may occur before or at the same time as an increase in blood pressure:

- A sudden gain in weight of more than about 2 lb per week is a warning sign. Usually you can expect to gain 3-4 lb over the first 12 weeks and about 3-4 lb per month during the rest of pregnancy.
- Swelling (*edema*) particularly of the face or fingers may indicate a problem. This occurs because too much salt is saved by the body instead of being eliminated.
- Headaches, blurred vision or other visual problems, or pain in the upper abdomen are signs that may appear before a seizure occurs.

Prenatal Care

Since there are no distinct symptoms of high blood pressure, a woman could have it for weeks without knowing it. The only way to detect high blood pressure is to have it measured by your doctor or nurse. This is why regular checkups in pregnancy are so important. A woman's weight and blood pressure are recorded during each prenatal visit to detect any changes that might have occurred. A urinalysis test of a sample of urine is also done to check for further signs of preeclampsia.

Once your doctor is aware that you have a high risk, he or she will observe you more often. Women who are at risk may be checked two or three times a week or more often for any changes in blood pressure.

Fetal Testing

If a rise in blood pressure is detected several weeks before the baby is born, several tests may be done to see if the fetus is developing normally. *Ultrasound*, for example, will show if the size of the fetus is normal for the number of weeks of pregnancy. It can also detect the presence of too little amniotic fluid-showing that the changes in blood pressure have interfered with the growth and the function of the placenta.

Electronic fetal monitoring can measure the fetal heart rate. If the heart rate increases when the fetus moves, this is a sign that the fetus is getting enough oxygen. A drop in the heart rate after a uterine contraction may mean that the fetus is not getting enough oxygen.

If these tests or others show that the fetus is having problems in the uterus, the baby may be delivered as soon as possible. A premature baby will be transferred to an intensive care unit where the baby will be given special care until he or she has gained weight and strength.

Treatment of Small Increases in Blood Pressure

If there is a mild increase in a woman's blood pressure, the doctor will probably advise her to rest in bed as much as she can. At this stage, the blood pressure will usually return to normal with rest. When resting, the woman may be advised to lie on her side-this position improves the flow of blood to the uterus and the kidneys. Some doctors hospitalize women as soon as there is a slight increase in blood pressure; others wait until the blood pressure is higher. Each case is different; your doctor will advise what action best suits your own needs.

Treatment of Severe High Blood Pressure

Severe preeclampsia can be fatal to the mother; at this point she must be hospitalized. The only treatment for very severe preeclampsia is to deliver the fetus. When a woman's blood pressure rises to a dangerous level, the doctor will decide whether to induce labor or perform a *cesarean birth*. After delivery, the woman's blood pressure usually returns to normal.

What you can do

Until more is known about what causes preeclampsia, the best approach is to prevent it from progressing to severe stages. Following these steps will make your pregnancy safer:

1. If you have high blood pressure before pregnancy, work with your doctor so that you can get it under control with medication before you get pregnant.
2. If you are overweight, lose extra weight before pregnancy.
3. See your doctor regularly, beginning as soon as possible in pregnancy, so that changes in your blood pressure and weight can be detected as soon as they occur.
4. If you have had high blood pressure, kidney disease, or any of the risk factors for high blood pressure in pregnancy, be sure you tell your doctor early in pregnancy.
5. Eat a balanced diet during pregnancy, including enough protein—at least three servings a day. Don't diet. If you are underweight or under 20 years of age, you should probably gain more than the usual 25lb during pregnancy.
6. Follow your doctor's instructions strictly about bed rest.
7. If you develop any of the warning signs of preeclampsia or eclampsia, tell your doctor immediately.

Risk in Future Pregnancies

Some experts believe that if preeclampsia occurs during a woman's first pregnancy and late in the pregnancy, it will probably never happen again.

If preeclampsia develops in a later pregnancy, the woman is more likely to have an underlying medical disorder that caused the blood pressure to rise. Her doctor will examine her carefully after pregnancy to try to find out what the problem is. Because she is prone to develop high blood pressure, she will want to discuss this with her doctor before attempting to become pregnant again.

If a woman had chronic high blood pressure before pregnancy and developed preeclampsia as well, the risk if this combination of problems happening again is very high. These women should also discuss childbearing with their doctors before becoming pregnant and should follow their doctors' advice closely in future pregnancies.

Glossary

Arteries: Large blood vessels leaving the heart and carrying blood to the head, torso, arms, and legs.

Arterioles: Small arteries that can become larger and smaller, lowering and increasing the blood pressure.

Blood Pressure: The force of the blood against the walls of the arteries.

Cesarean Birth: Delivery of a baby and the placenta through an incision made in a woman's abdomen and uterus.

Diastolic Blood Pressure: The force of the blood in the arteries when the heart is relaxed; the lower blood pressure reading.

Eclampsia: Another name for seizures in pregnancy that occur because of high blood pressure.

Edema: A watery swelling of parts of the body.

Electronic Fetal Monitoring: A method of measuring, with electronic instruments, the heart beat of a fetus in response to the contractions of the mother's uterus.

Placenta: The organ through which the fetus gets nourishment.

Preeclampsia: Another name for high blood pressure in pregnancy.

Systolic Blood Pressure: The force of the blood in the arteries when the heart is contracting; the high blood pressure reading.

Ultrasound: A test that involves the use of sound waves to show picture of the inside of the body, including the fetus inside the mother's uterus.

Urinalysis: A test done on a sample of urine.

Veins: Blood vessels that carry blood from the rest of the body back to the heart.

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