

About High Blood Pressure

What is High Blood Pressure?

Blood pressure is the force of blood against the artery walls. It is often written or stated as two numbers. The first or top number represents the pressure when the heart contracts. This is called systolic pressure. The second or bottom number represents the pressure when the heart rests between beats. This is called diastolic pressure.

Blood pressure is traditionally measured with a device called a sphygmomanometer. It measures blood pressure in millimeters of mercury (mmHg). An inflatable cuff is wrapped around the arm and is inflated to squeeze the blood vessels in the arm. The health care provider uses a stethoscope to listen to the pulse as the pressure is released in order to determine the systolic and diastolic pressure. Some blood pressure testing devices are now electronic and provide digital readouts of the blood pressure measurement and pulse rate.

Blood pressure normally rises and falls throughout the day. When it consistently stays too high for too long, it is called hypertension. The Seventh Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure notes these levels for defining normal and high blood pressure in adults:

- High blood pressure or hypertension for adults is defined as a systolic blood pressure of 140 mmHg or higher or a diastolic blood pressure of 90 mmHg or higher.
- Normal blood pressure is a systolic blood pressure of less than 120 mmHg and a diastolic blood pressure of less than 80 mmHg.
- Prehypertension is defined as a systolic blood pressure of 120–139 mmHg or a diastolic blood pressure of 80–89 mmHg. Persons with prehypertension are at increased risk to progress to hypertension.

If the systolic and diastolic blood pressure levels are in different categories, blood pressure status is defined according to the higher category. For example, a person with a high systolic pressure but a normal diastolic pressure will be considered to have high blood pressure (sometimes referred to as systolic hypertension). A person with a high diastolic pressure but a normal systolic pressure will be considered to have high blood pressure also (sometimes referred to as diastolic hypertension).

High blood pressure for adults will usually be measured on at least two different doctor visits before a diagnosis of high blood pressure is made.

For children, high blood pressure is determined by comparing the child's blood pressure with the distribution of blood pressure for children of similar sex, age and height. A child whose blood pressure is greater than or equal to 95% of children of similar sex, age, and height (at or above the 95th percentile) would be considered to have high blood pressure. Prehypertension in children is classified as a blood pressure of 120/80 mmHg or higher but below the 95th percentile. A diagnosis of high blood pressure should be based on blood pressure readings on at least three different visits. The correct-size blood pressure cuff must be used.

More importantly, high blood pressure can be prevented or controlled through lifestyle changes and with medications when needed.

Types of High Blood Pressure

Essential hypertension—in most cases, high blood pressure does not have a specific treatable cause. This form is called essential hypertension.

Secondary hypertension—in a few cases, the cause of hypertension is some other underlying condition. This is called secondary hypertension. This may be due to kidney disorders, congenital abnormalities, or other conditions. Blood pressure usually returns to normal when the problem is corrected.

Pregnancy-related hypertension—existing high blood pressure can predispose some women to develop problems when they become pregnant. This is called pre-existing chronic hypertension. Also, some women first develop hypertension when they are pregnant. There are several types of this pregnancy-induced hypertension, sometimes called gestational hypertension. Either type of high blood pressure can harm the mother's kidneys and other organs, and it can cause low birth weight and early delivery. Preeclampsia is a serious condition of pregnancy and is related to increased blood pressure and protein in the mother's urine (as a result of kidney problems). Preeclampsia affects the placenta, and it can affect the mother's kidney, liver, and brain. When preeclampsia progresses and seizures develop, the condition is known as eclampsia—the second leading cause of maternal death in the United States. Preeclampsia is also a leading cause of fetal complications, which include low birth weight, premature birth, and stillbirth. Most women who develop signs of preeclampsia are closely monitored to lessen or to avoid related problems. Treatment is focused on reducing water retention and lowering blood pressure to normal limits.

Treatment of High Blood Pressure

High blood pressure can be treated with both lifestyle modifications, usually as the first step, and, if needed, with medications. Lifestyle factors to treat high blood pressure

include weight control, exercise, healthy diet, limiting alcohol use, and other lifestyle modifications. See our the link below for more on these lifestyle factors.

There are several types of medications that are used to treat high blood pressure. Frequently, more than one type will be used. It is important to take these as prescribed. High blood pressure medicines fall into one of these types:

- **Diuretics** work in the kidney and flush excess water and sodium from the body. They are sometimes called "water pills."
- **Beta-blockers** reduce nerve impulses to the heart and blood vessels that make the heart beat slower and with less force.
- **Angiotensin-converting enzyme (ACE) inhibitors** cause the blood vessels to relax. ACE inhibitors prevent the formation of a hormone called angiotensin II, which normally causes the blood vessels to narrow.
- **Angiotensin antagonists** shield the blood vessels from angiotensin II. As a result, the vessels become wider.
- **Calcium channel blockers** prevent calcium from entering the muscle cells of the heart and blood vessels. This causes the blood vessels to relax.
- **Alpha-blockers** reduce nerve impulses to the blood vessels, which allows the blood to pass more easily.
- **Alpha-beta-blockers** work the same way as alpha-blockers but also slow the heartbeat, as beta-blockers do. As a result, less blood is pumped through the vessels.
- **Nervous system inhibitors** relax blood vessels by controlling nerve impulses. This causes the blood vessels to become wider.
- **Vasodilators** directly open the blood vessels by relaxing the muscle in the vessel walls.

Outcomes of High Blood Pressure

High blood pressure is often called the 'silent killer' because it usually has no noticeable warning signs or symptoms until other serious problems arise. Therefore, many people with high blood pressure do not know that they have it. High blood pressure is a major risk factor for heart disease, the leading cause of death in the United States. It can lead to hardened or stiffened arteries, which causes a decrease of blood flow to the heart muscle and other parts of the body. Reduced blood to the heart muscle can lead to angina (chest

pain or damage to the heart muscle due to a lack of blood carrying oxygen to the heart muscle) or to a heart attack (caused by a chronic spasm or blockage of blood and oxygen to the heart).

High blood pressure is a major risk factor for heart failure, a serious condition where the heart cannot pump enough blood for the body's needs. It is also the major risk factor for stroke, which is the third leading cause of death in the United States. A stroke may be caused by a rupture or blockage of an artery that supplies blood and oxygen to the brain.

In addition, high blood pressure can result in damage to the eyes, including blindness. The blood vessels in the eyes can rupture or burst from high blood pressure leading to impairment of sight.

High blood pressure can also result in kidney disease and kidney failure. The kidneys filter wastes from fluids in the body. High blood pressure can thicken and narrow the blood vessels of the kidneys, resulting in less fluid being filtered and wastes building up in the body. Also, diseases of the kidney can be a cause of high blood pressure.

For more information, go to www.cdc.gov/bloodpressure/about.htm