

# High blood pressure (hypertension)

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## Overview

High blood pressure (hypertension) is often called a silent killer because you can have it for years without knowing it. In fact, about 50 million Americans have high blood pressure, but about 30 percent of them don't know it.

Blood pressure is determined by the amount of blood your heart pumps and the amount of resistance to blood flow in your arteries. Your blood pressure normally varies during the day. It can even vary slightly with each beat of your heart. It increases during activity and decreases with rest.

Many people may not view high blood pressure as life-threatening. But uncontrolled high blood pressure can increase your risk of serious health problems. Fortunately, high blood pressure can be detected with a simple test — and once you know you have high blood pressure, you can work with your doctor to control it.

## Signs and symptoms

Most people with high blood pressure have no signs or symptoms, but people often think that headaches, dizziness or nosebleeds are common warning signs and symptoms of high blood pressure. It's true that a few people with early-stage high blood pressure have a dull ache in the back of their heads when they wake in the morning. Or perhaps they have a few more nosebleeds than normal.

Headaches, dizziness or nosebleeds typically don't occur until high blood pressure has reached a more advanced stage — one that's possibly life-threatening. Even so, most people with the highest blood pressure readings don't experience any of these symptoms.

Other signs and symptoms sometimes associated with high blood pressure generally are caused by other conditions that can lead to high blood pressure. Such signs and symptoms include:

- Excessive perspiration
- Muscle cramps
- Weakness
- Frequent urination
- Rapid or irregular heartbeat (palpitations)

## Causes

The more blood your heart pumps and the narrower your arteries, the higher your blood pressure. A blood pressure reading consists of two numbers:

- **The top number indicates systolic pressure.** This is the amount of pressure your heart generates when pumping blood out through your arteries.

- **The bottom number indicates diastolic pressure.** This is the amount of pressure in your arteries when your heart is at rest between beats.

The most recent guidelines for high blood pressure were issued in the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC) and published in the *Journal of the American Medical Association* in May 2003. The JNC represents a coalition of leaders from 46 professional, public, voluntary and federal health care agencies, including the American College of Cardiology, the American Diabetes Association, the American Heart Association, the American Public Health Association, the American Society of Hypertension, and the National Heart, Lung, and Blood Institute. According to these guidelines, blood pressure for adults is classified as follows:

- **Normal blood pressure.** Your blood pressure is normal only if it's below 120/80 millimeters of mercury (mm Hg), but some data indicate that 115/75 mm Hg should be the new gold standard. Once your blood pressure rises above that threshold, your risk of cardiovascular disease may begin to increase.
- **Prehypertension.** Prehypertension is a systolic pressure ranging from 120 to 139 or a diastolic pressure ranging from 80 to 89. If your blood pressure is right at 120/80, you have prehypertension — your blood pressure isn't normal or optimal.
- **Stage 1 hypertension.** This includes a systolic pressure ranging from 140 to 159 or a diastolic pressure ranging from 90 to 99.
- **Stage 2 hypertension.** The most severe hypertension, this includes a systolic pressure of 160 or higher or a diastolic pressure of 100 or higher.

Only one of the numbers — the top or the bottom — needs to be high for you to have prehypertension or hypertension.

In 90 percent to 95 percent of high blood pressure cases, there's no identifiable cause. This type of high blood pressure is called essential hypertension or primary hypertension. It differs from secondary hypertension, in which the increased pressure results from another underlying condition, such as:

- Kidney disease
- Adrenal disease
- Thyroid disease
- Abnormal blood vessels
- Preeclampsia — high blood pressure and protein in the urine after the 20th week of pregnancy
- Sleep apnea

Certain medications, including birth control pills, cold remedies, decongestants, over-the-counter pain relievers and some prescription drugs, may also cause secondary hypertension.

Although acetaminophen (Tylenol, others) was once considered very safe, researchers reported in September 2005 that regular use of higher doses may increase the risk of secondary hypertension. Researchers studied 5,000 women who didn't have high blood pressure when the studies began. Women who took an average of 500 milligrams or more of acetaminophen daily over several years were more likely to develop high blood pressure than were women who didn't take any acetaminophen. It's not known if the same holds true for men since they weren't included in this study. The women were part of two phases of the Nurses' Health Study, a study of more than 200,000 nurses that began in 1976 and still continues.

Illegal drugs, such as cocaine and amphetamines, can also increase blood pressure.

Secondary hypertension may have a more rapid onset and cause higher blood pressure than does primary hypertension, which tends to develop gradually over many years.

## Risk factors

There are four major risk factors for high blood pressure that you can't control. They are:

- **Age.** Your risk of high blood pressure increases as you get older.
- **Race.** High blood pressure occurs far more frequently in blacks than in any other racial group in the United States. High blood pressure in blacks generally develops at an earlier age than it does in whites. Plus, it's more likely to lead to serious complications such as stroke or heart attack.
- **Sex.** In young adulthood and early middle age, high blood pressure is more common in men than in women, but the opposite is true for men and women age 60 and older.
- **Family history.** High blood pressure tends to run in families.

The risk factors you can control or manage include:

- **Obesity.** The greater body mass you have, the more blood you need to supply oxygen and nutrients to your tissues. The volume of blood circulated through your blood vessels increases and creates extra force on your artery walls. In addition, fat cells produce chemicals that circulate and affect your blood vessels and heart.
- **Inactivity.** Lack of physical activity increases your risk of high blood pressure by increasing your risk of being overweight. Inactive people also tend to have higher heart rates. Their heart muscles have to work harder with each contraction, increasing the force on the arteries.
- **Tobacco use.** The chemicals in tobacco can damage the lining of your artery walls, causing the arteries to accumulate fatty deposits that contain cholesterol (plaques). Nicotine also constricts your blood vessels and forces your heart to work harder.
- **Sodium sensitivity and salt intake.** People who are sodium sensitive retain sodium more easily, leading to fluid retention and increased blood pressure.
- **Low potassium intake.** Potassium is a mineral that helps balance the amount of sodium in your cells. If you don't consume or retain enough potassium, you can accumulate too much sodium.
- **Excessive alcohol.** Exactly how or why alcohol increases blood pressure isn't understood. But over time, heavy drinking can damage your heart muscle.
- **Stress.** High levels of stress can lead to a temporary but dramatic increase in blood pressure. Stress also can promote high blood pressure if you then try to relax by eating more, using more nicotine or drinking more alcohol.

You may also be at increased risk of high blood pressure if you have certain chronic conditions. Examples include high blood cholesterol, diabetes and sleep apnea.

High blood pressure in children, more often than in adults, indicates that something else is wrong, and the increase in blood pressure is a sign of an underlying condition. In general, high blood pressure in children is uncommon. However, as an increasing number of children become less physically active and more obese, a greater percentage of them are developing high blood pressure.

## When to seek medical advice

Have your blood pressure checked at least every two years. The interval at which you should have your blood pressure rechecked depends not only on your most recent blood pressure reading, but also on your past blood pressure readings, your other risk factors for heart disease and the presence of other diseases. Ask your doctor about the best interval for you.

## Screening and diagnosis

Blood pressure is measured with a medical device called a sphygmomanometer, which consists of an inflatable arm cuff and a pressure-measuring gauge. High blood pressure is most often discovered during a routine physical examination. However, a single high blood pressure reading usually isn't enough for a diagnosis. You have high blood pressure only if your blood pressure readings are persistently high at two or more office visits over several weeks or months.

Everyone's blood pressure normally varies throughout the day. And some people have a rise in blood pressure especially during visits to a doctor — a phenomenon known as white-coat hypertension. That's why it's important to take more than one reading and on more than one occasion. Your doctor may ask you to record your blood pressure at home and at work to provide additional information.

For years health professionals tended to focus on diastolic pressure, which is the bottom number. The theory was this: The body can tolerate occasional increases in systolic pressure, but diastolic pressure that stays consistently high can lead to organ damage. However, this theory has been revised. A high systolic reading is now considered an equally important value and a more important number for people older than 50. In fact, many people, particularly older Americans, have a normal diastolic level but an elevated systolic level. This type of high blood pressure is called isolated systolic hypertension (ISH). In people older than 55, the pulse pressure — the difference between the systolic and diastolic pressures — is an important predictor of health risks as well.

If you have any type of high blood pressure, your doctor is likely to do the following:

- Ask you questions about your health and your family's health (a health history).
- Do a physical examination.
- Ask you to have routine tests such as a urine test (urinalysis), a blood test and an electrocardiogram (ECG), which measures your heart's electrical activity.
- Consider the need for more specialized tests to examine blood flow. These tests may include ultrasonography, magnetic resonance angiography, angiography, computerized tomography (CT), magnetic resonance imaging (MRI) or nuclear scanning. They're especially important if your doctor is looking for secondary causes of hypertension.

## Complications

If you have high blood pressure, you need to control it. Over time excessive force on your artery walls can seriously damage many of your body's vital organs. The higher your blood pressure or the longer it goes uncontrolled, the greater the damage. By the time symptoms appear, you may already have an injury.

Many studies demonstrate a direct relationship between uncontrolled high blood pressure and increased risk of stroke, heart attack, heart failure, kidney failure and eye problems. More specifically, high blood pressure can lead to the following problems:

- **Damage to your arteries.** This can result in hardening and thickening of the arteries (arteriosclerosis), deposits of fat in the artery linings (atherosclerosis) and an enlarged, bulging blood vessel (aneurysm).
- **Thickening of the heart's main pumping chamber.** Called left ventricular hypertrophy, this can eventually lead to heart failure. The heart muscle thickens in order to pump blood against the higher pressure in the vessels. More blood is needed to do this, but narrowed blood vessels cannot supply that blood. At the same time, the thickened muscle may have a hard time pumping enough blood to meet your body's needs, causing fluid to build up in your lungs or in your feet and legs.
- **A blocked or ruptured blood vessel in your brain.** This can lead to stroke. High blood pressure is a risk factor for both types of stroke — ischemic stroke and hemorrhagic stroke.
- **Weakened and narrowed blood vessels in your kidneys.** This can prevent these organs from functioning normally.

- **Thickened, narrowed or torn blood vessels in the eyes.** This can result in vision loss.
- **Metabolic syndrome.** This syndrome is a cluster of disorders of your body's metabolism — including high blood pressure, high insulin levels, excess body weight and abnormal cholesterol levels. If you have high blood pressure, you're more likely to have other components of the syndrome. The more components you have, the greater your risk of developing diabetes, heart disease or stroke.

Having high blood pressure may also lessen your ability to think, remember and learn as you age. Uncontrolled high blood pressure has even been linked to cognitive decline and dementia.

## Treatment

The goal of treatment is to prevent health complications that may occur as a result of high blood pressure. Your doctor also may suggest steps to control disorders such as diabetes and high blood cholesterol, which may contribute to high blood pressure or may occur along with high blood pressure. Treating conditions such as diabetes and high blood cholesterol will reduce your risk of heart attack and stroke beyond the benefits accrued by lowering blood pressure.

Blood pressure goals aren't the same for everyone. Although everyone should strive to reach blood pressure readings of below 140/90, doctors recommend lower readings for people with certain conditions. The goal is 130/80 if you have or have had chronic kidney disease or diabetes.

The safest way to control your blood pressure is to change your lifestyle. But sometimes lifestyle changes alone can't reduce your blood pressure enough. You may also have to treat another medical condition besides high blood pressure. In these cases, you may need medication. Discuss with your doctor the goals of treatment and the roles that both lifestyle changes and medications can play. Maintaining lifestyle changes may improve the effectiveness of the medications you're taking and may mean you'll need fewer drugs or lower dosages.

Many types of medications to lower blood pressure are available. They lower your blood pressure in different ways. If one medication doesn't decrease your blood pressure to a safe level, your doctor may substitute another one or add one to your regimen.

The major types of medication used to control high blood pressure include:

- **Diuretics.** These medications act on your kidneys to help your body eliminate sodium and water, reducing blood volume. Diuretics are often the first — but not the only — choice in treatment because they're often the most effective.
- **Beta blockers.** These medications block the effects of certain adrenaline-related chemicals, causing your heart to beat more slowly and less forcefully.
- **Angiotensin-converting enzyme (ACE) inhibitors.** These medications help relax blood vessels by blocking the formation of a naturally occurring chemical that narrows blood vessels. These medications are especially important in treating high blood pressure in people with coronary heart disease, heart failure or kidney failure.
- **Angiotensin II receptor blockers.** These medications help relax blood vessels by blocking the action — not the formation — of a naturally occurring chemical that narrows blood vessels.
- **Calcium antagonists, also known as calcium channel blockers (CCBs).** These medications help relax the muscles of blood vessels. Some slow your heart rate. A word of caution, though: If you take certain calcium antagonists, don't eat grapefruit or drink grapefruit juice. Grapefruit juice interacts with some calcium antagonists, causing blood levels of the medication to rise and putting you at a higher risk of side effects from the drug. This action of the juice may persist for 24 hours. If you're concerned about interactions, talk to your doctor or pharmacist.

To achieve a blood pressure goal, your doctor may recommend the use of multiple drugs. In fact, low-dose medications in combination can lower blood pressure as well as can larger doses of one drug. This strategy may

reduce the number of doses you need a day, which can reduce side effects. Most people can control their blood pressure with long-acting drugs, so the medications need to be taken only once or twice daily. Your doctor may suggest you take aspirin once your blood pressure is under control in order to reduce your risk of cardiovascular disorders.

Other drug classes may be used in addition to combinations of the above medications, when blood pressure hasn't reached a set goal. These drug classes may include:

- **Alpha blockers.** These medications prevent muscle contractions in smaller arteries and reduce the effects of naturally occurring body chemicals that narrow blood vessels.
- **Central-acting agents.** These medications prevent your brain from signaling your nervous system to increase your heart rate and narrow your blood vessels.
- **Direct vasodilators.** These medications work directly on the muscles in the walls of your arteries, preventing the muscles from tightening and your arteries from narrowing.

## Self-care

The best strategy for controlling and preventing high blood pressure is to begin with lifestyle changes. This is true even if you're taking medication to reduce high blood pressure. You may require higher dosages of medication than otherwise needed if you don't make certain changes in your habits. Here's what you can do:

- **Eat for health.** Eat a healthy diet based on a variety of foods, such as the Dietary Approaches to Stop Hypertension (DASH) diet. This diet emphasizes plenty of grains, fruits, vegetables and low-fat dairy foods. It can promote weight loss and help to lower blood pressure. Limiting sodium in your diet can also reduce blood pressure.
- **Achieve a healthy weight.** If your body mass index (BMI) is 25 or more, lose weight. Losing as few as 10 pounds may reduce your blood pressure.
- **Exercise.** Regular aerobic exercise seems to lower blood pressure in some people, even without weight loss. For example, vigorous walking for 30 minutes most days of the week will lower blood pressure and help with weight loss. Instead of meeting for lunch, decide to take a walk for your health.
- **Don't smoke.** If you smoke, find a way to quit. When you have high blood pressure, using tobacco can lead to more cholesterol and other fatty deposits in your arteries (atherosclerosis) and promote the constriction of your blood vessels.
- **Limit alcohol and caffeine.** Even if you're healthy, alcohol and caffeine can raise your blood pressure to an unhealthy level. Reducing your consumption of alcohol can reduce your blood pressure. If you cut back to a moderate level of alcohol consumption, you can lower your systolic pressure by about two to four points and your diastolic pressure by about two points. Cutting caffeine can also make a difference.
- **Manage stress.** Stress can increase your blood pressure temporarily and aggravate existing blood pressure. Over time, the physical effects of stress can be damaging to your health. You can avoid and better cope with stress by making changes in your normal routine and by developing relaxation techniques. You may be able to make your daily routine less stressful by doing such things as getting organized, simplifying your schedule, maintaining good social relationships, practicing positive thinking and scheduling daily "worry time" or dedicated time for solving or thinking about your problems. Relaxation techniques may include muscle relaxation exercises, guided imagery, meditation and deep-breathing exercises. You can also use a medical device called Resperate, which is designed to help lower blood pressure with deep breathing. This over-the-counter device includes an elastic belt with a respiration sensor, headphones and a small unit that looks like a portable CD player. The device analyzes your breathing pattern and then creates two distinct tones to guide your inhalation and exhalation. The goal is to lengthen your exhalation and to slow your breathing to fewer than 10 breaths a minute.
- **Get plenty of sleep.** When you're refreshed, you're better able to tackle the next day's problems, allowing you to avoid and better cope with stress. Going to sleep and awakening at a consistent time each day can

help you sleep well. A bedtime ritual such as taking a warm bath, reading or eating a snack helps many people relax.

See your doctor if your blood pressure hasn't decreased after three to six months of lifestyle changes. Your doctor may prescribe medication that can be used in conjunction with healthy changes in your diet and exercise habits.

## Coping skills

High blood pressure isn't a problem that you can treat and then ignore. It's a condition you need to manage for the rest of your life. Steps you can take include:

- **Measure your blood pressure at home.** Home blood pressure monitoring is an important part of managing high blood pressure. Home monitoring can help you keep closer tabs on your blood pressure, show if medication is working, and even alert you and your doctors to potential health complications.
- **Take your medications properly.** If side effects or costs pose problems, talk with your doctor instead of just discontinuing your medications.
- **Manage stress.** Get more sleep, learn to say no to extra tasks, release negative thoughts and maintain good relationships, and remain patient and optimistic.
- **Make regular visits to your doctor.** It takes a team effort to treat high blood pressure successfully. Your doctor can't do it alone, and neither can you. The two of you need to work together to bring your blood pressure down to a safe level — and keep it there.
- **Adopt positive health habits.** This includes eating a healthy diet, losing weight, exercising, not smoking, and limiting alcohol and caffeine intake.

Doing all this can be difficult if you don't feel or see any signs or symptoms. Reviewing the risk factors and complications associated with high blood pressure can give you an extra incentive.

Educating your family and friends is important in helping you cope. When people don't understand the danger of uncontrolled high blood pressure, they can unintentionally work against you. For example, they might offer you unhealthy food or complain about the cost of your medicine.

When family and friends fully understand that uncontrolled high blood pressure threatens your life, they'll encourage you to take your medicine, eat well and go for your daily walk.

Name \_\_\_\_\_

Date \_\_\_\_\_

### HIGH BLOOD PRESSURE TEST

1. High blood pressure can be detected early by recognizing early symptoms  
Such as nosebleed & dull headaches:  
  
True\_\_\_\_\_ False\_\_\_\_\_
2. Other symptoms of high blood pressure are:
  - a. excessive perspiration & muscle cramp
  - b. weakness & frequent urination
  - c. rapid or irregular heart beat
  - d. all of the above
3. Normal blood pressure reading is 120/80 or higher:  
  
True\_\_\_\_\_ False\_\_\_\_\_
4. Systolic (top number) pressure measures the amount of pressure your heart generates  
when pumping blood through your arteries:  
  
True\_\_\_\_\_ False\_\_\_\_\_
5. Diastolic pressure measures pressure in your arteries when your heart is at rest:  
  
True\_\_\_\_\_ False\_\_\_\_\_
6. Both systolic/diastolic pressure needs to be high in order to have pre-hypertension:  
  
True\_\_\_\_\_ False\_\_\_\_\_
7. In 95% of all cases there is a specific cause for high blood pressure:  
  
True\_\_\_\_\_ False\_\_\_\_\_
8. You have high BP only if your BP readings are persistently high at 2 or more office visits  
over several weeks/months:  
  
True\_\_\_\_\_ False\_\_\_\_\_
9. High blood pressure over time can:
  - a. cause severe damage to your body's vital organs
  - b. cause inability to sleep at night
  - c. cause severe headaches
  - d. all of the above

10. Most studies show uncontrolled high blood pressure can lead to Stroke, heart attack, heart failure, kidney failure and eye problems:

True\_\_\_\_\_ False\_\_\_\_\_

11. Medication is the only way to control high blood pressure:

True\_\_\_\_\_ False\_\_\_\_\_

12. Diabetes & high cholesterol may contribute to high blood pressure:

True\_\_\_\_\_ False\_\_\_\_\_

13. Multiple drugs may be used to help lower high blood pressure:

True\_\_\_\_\_ False\_\_\_\_\_

14. Secondary hypertension may have a rapid onset as opposed to primary hypertension that may develop over the years:

True\_\_\_\_\_ False\_\_\_\_\_

15. Risk factors for developing high blood pressure:

- a. age
- b. sex – race
- c. sex (male or female)
- d. family history
- e. all of the above

16. Those risk factors you can control are:

- a. environment, age, family history
- b. obesity, tobacco use, excessive alcohol
- c. inactivity, sodium intake
- d. both b and c

17. You should have a blood pressure check:

- a. every 6 months
- b. every 2 years
- c. every 5 years
- d. only when you feel like you have high blood pressure

18. High blood pressure:

- a. lasts 4 – 5 years
- b. needs to be treated for the rest of your life
- c. requires excessive bed rest
- d. all of the above

19. Steps you can take to decrease high blood pressure:

- a. take your medication properly
- b. manage stress
- c. routine visits to doctor
- d. eat healthy
- e. all of the above