

What is Hypertension or “High Blood Pressure”?

Each time your heart beats, it creates a force which allows blood to circulate throughout your body. **When this force is too strong it is referred to as “high blood pressure” or “hypertension”.** High blood pressure may damage the arteries and cause problems such as a heart attack or stroke. It can also cause damage to the kidneys leading to kidney failure.

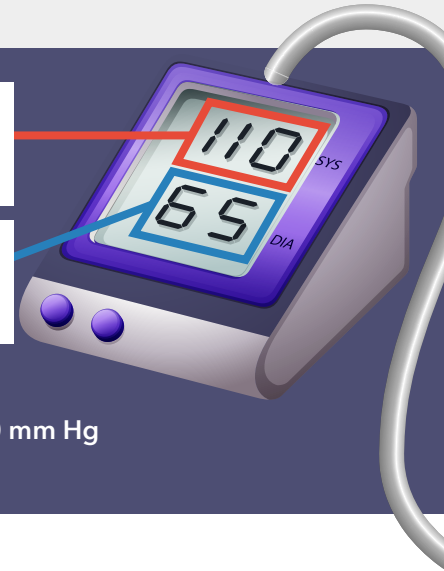
Half of adults in the United States (nearly 108 million people) have high blood pressure. Only about 1 in 4 adults (24%) with hypertension have their condition under control.^{1,2}

Your blood pressure reading is reported in **millimeters of mercury**, which is commonly abbreviated as “**mm Hg**”.

Your reading will consist of **2 numbers**, such as 110/65 mm Hg.

Measures the force of blood in your arteries as your heart beats, known as “**systolic pressure.**”

Measures the force of blood in your arteries when your heart relaxes between beats, known as “**diastolic pressure.**”



High blood pressure occurs when one or both of these numbers are too high.

High blood pressure is defined as a systolic pressure greater than or equal to (\geq) 130 mm Hg or a diastolic blood pressure \geq 80 mm Hg.

Symptoms

Often people with high blood pressure have no symptoms. Some may have headaches, nosebleeds, fatigue, and feel or look flushed, but these signs and symptoms are not just seen with high blood pressure and may be caused by some other condition. **This is one reason why it is important to have regular check-ups with your healthcare team, including a blood pressure check.**

- Blood pressure is measured as part of a doctor’s appointment and should be checked at least every two years starting at age 18. If you are 40 years of age or older, or have a family history of high blood pressure, or are overweight, you should have your blood pressure checked at least once yearly.³ If you have high blood pressure, heart disease or other risk factors, it is a good idea to have your blood pressure checked more often.
- You may be able to get a free blood pressure screening in your community or in local pharmacies. There are also low-cost at-home blood pressure monitors sold in stores and online. Home blood pressure checks are an important way to see if you have high blood pressure; to find out if your blood pressure treatment is working; or to ensure that your high blood pressure is not getting worse. Speak with your doctor about the best option for you!
- Devices that measure your blood pressure at your wrist or finger are not recommended by the American Heart Association because they are less reliable.



Causes of Hypertension

- **Primary hypertension** is diagnosed when a cause is not known. Approximately 90-95% of adults with hypertension have primary hypertension.⁴
- **Secondary hypertension** is caused by another medical condition, such as those that affect your kidneys, thyroid, or adrenal glands. Proper treatment of secondary hypertension involves controlling the underlying condition which reduces both your blood pressure and your risk of serious complications such as heart disease, kidney failure, and stroke.



Hypertension in Children

- High blood pressure also affects children. Children age 3 and older will usually have blood pressure checked as a part of their yearly checkups.³ Normal blood pressure readings in children vary with age and are different between boys and girls. Deciding if a child has high blood pressure is important, but requires experience. Pediatricians and Family Physicians can offer appropriate advice.
- High blood pressure in children is often caused by a medical condition, especially in younger children. Sudden weight gain can also cause an increase in blood pressure. Your child’s doctor can help determine the most likely cause of high blood pressure and suggest the best treatment.
- High blood pressure in children can often be avoided or improved with a proper diet, staying physically active, and avoiding exposure to secondhand smoke.

Categories

Blood pressure levels can be grouped into several categories, which help determine if treatment is needed⁷:

Normal blood pressure	Below 120/80 mm Hg .
Pre-hypertension	A systolic pressure (top number) ranging from 120 to 129 mm Hg and a diastolic pressure (bottom number) below 80 mm Hg . This may get worse over time unless elevated blood pressure is corrected.
Stage 1 hypertension	A systolic pressure ranging from 130 to 139 mm Hg or a diastolic pressure ranging from 80 to 89 mm Hg .
Stage 2 hypertension	A systolic pressure of 140 mm Hg or higher or a diastolic pressure of 90 mm Hg or higher.
Severe Hypertension	A blood pressure over 180/120 mm Hg requires medical assessment and care. If this reading is taken at home, retest in 5-10 minutes. If your blood pressure is still this high, contact your healthcare team immediately. If you also have chest pain, vision problems, headaches, confusion, slurred speech, numbness or weakness, breathing difficulty, call 911 or your local emergency medical number since these may be signs of a stroke or heart attack.



Lifestyle Changes

Lifestyle changes can be important to prevent or lower high blood pressure.

- Decrease the salt (sodium) in your diet to less than 2,300 milligrams (mg) a day or less. Up to 1500 mg a day is best for most adults. This can be done by not adding salt to your food, avoiding canned or packaged soups, processed meats, and frozen dinners.⁹ If you can, speak with a registered dietitian or nutritionist.
- Add fruits, vegetables, low-fat dairy foods, whole grains, poultry, and fish to your diet.⁹
- Eat bananas, oranges, cantaloupe, honeydew, apricots, grapefruit, prunes, raisins, dates, spinach, broccoli, sweet potatoes, mushrooms, peas, and cucumbers.⁸
- Maintain a healthy weight or lose weight if you are overweight. You may be able to reduce your blood pressure by about 1 mm Hg with each kilogram (about 2.2 pounds) of weight you lose.⁹
- Regular physical activity can help reduce stress, promote a normal weight, lower your blood pressure, and reduce your risk of many health conditions.¹⁰
- Get moving! Try to walk, run, swim, or ride your bike for 150 minutes a week.¹⁰
- Limit alcohol, with up to one drink a day for women, and up to two drinks a day for men. One drink equals 12 ounces of beer, 5 ounces of wine or 1.5 ounces of 80-proof liquor.⁷
- Don't smoke! Smoking cigarettes can injure blood vessels and increase the buildup of plaque in your arteries. Ask your healthcare team if you need help quitting.
- Reduce stress as much as possible with muscle relaxation, deep breathing, yoga, or meditation, and get plenty of sleep.¹⁰



Medicines to Treat High Blood Pressure

- **Diuretics (water pills):** These help your kidneys to get rid of sodium and water from the body. There are different kinds of diuretics, including loop (i.e., furosemide, torsemide) thiazide (i.e., hydrochlorothiazide), and potassium sparing (i.e., spironolactone, triamterene, eplerenone, amiloride).^{11,12} Which one your doctor recommends depends on your blood pressure measurements and other health conditions, such as fluid retention, kidney disease or heart failure. These medications usually result in increased urination and may cause your body to lose potassium, so your doctor may either add potassium supplements or switch to a potassium-sparing diuretic.
- **Angiotensin-converting enzyme (ACE) inhibitors.** These medications, which all end in "pril" (enalapril, lisinopril, benazepril, captopril, fosinopril, quinapril, ramipril, and perindopril) – relax arteries by blocking the formation of a chemical which your body produces that narrows blood vessels. A common side effect of these medications is a dry cough.^{11,12}
- **Angiotensin II receptor blockers (ARBs).** These medications, which all end in "sartan" (losartan, telmisartan, irbesartan, candesartan, eprosartan, valsartan, azilsartan) relax blood vessels by blocking the activity of a chemical which your body produces that narrows blood vessels.^{11,12}
- **Calcium channel blockers.** These medications, most of which end in "pine" (amlodipine, nifedipine, felodipine, nicardipine, isradipine, diltiazem, verapamil) relax the muscles within your blood vessels. Some can decrease your heart rate.^{11,12}
- **Renin inhibitors** (aliskiren) decrease the production of renin, produced by your kidneys to increase blood pressure.^{11,12}
- **Beta blockers.** These medications, which all end in "lol" (atenolol, propranolol, timolol, pindolol, nadolol, betaxolol, metoprolol, acebutolol, bisoprolol) decrease your heart rate and the force with which your heart beats. Some (carvedilol, labetalol) may also relax your arteries.^{11,12}
- **Aldosterone antagonists** (spironolactone and eplerenone) are also diuretics. These drugs block the effect of a chemical that your body produces which that can cause salt and fluid retention, increasing your blood pressure.^{11,12}
- **Vasodilators** (hydralazine and minoxidil) act directly on the muscles in the walls of your arteries, preventing your arteries from narrowing.^{11,12}
- **Central-acting agents** (clonidine, guanfacine, guanabenz, methyldopa). These medications prevent your brain from making your nervous system increase your heart rate and narrow your blood vessels.^{11,12}

REFERENCES:

1. Centers for Disease Control. Facts About Hypertension. <https://www.cdc.gov/bloodpressure/facts.htm> accessed March 13, 2021.
2. Ostchega Y, et al. National Center for Health Statistics. Hypertension Prevalence Among Adults Aged 18 and Over: United States, 2017–2018. NCHS Data Brief No. 364, April 2020. <https://www.cdc.gov/nchs/products/databriefs/db364.htm> Accessed March 13, 2021.
3. High blood pressure. National Heart, Lung, and Blood Institute. <https://www.nhlbi.nih.gov/health-topics/high-blood-pressure> Accessed March 13, 2021.
4. Hajjar L, Kotchen TA. Trends in prevalence, awareness, treatment, and control of hypertension in the United States, 1988–2000. JAMA. 2003 Jul 9; 290(2):199–206.
5. The Fourth Report on the Diagnosis, Evaluation, and Treatment of High Blood Pressure in Children and Adolescents National High Blood Pressure Education Program Working Group on High Blood Pressure in C, Adolescents Pediatrics November 2004 114 2 555 576 10.1542/peds.114.2.555 15286277.Hypertension 44(4):387-8.
6. Flynn JT, Kaelber DC, Baker-Smith CM, et al, for the Subcommittee on Screening and management of high blood pressure in children and adolescents. Clinical practice guideline for screening and management of high blood pressure in children and adolescents. Pediatrics. 2017 Sep. 140(3): e20171904. doi: 10.1542/peds.2017-1904.
7. James PA, et al. 2014 evidence-based guideline for the management of high blood pressure in adults: report from the panel members appointed to the Eighth Joint National Committee (JNC 8). JAMA. 2014 Feb 5;311(5):507-20.
8. Aburto NJ, Hanson S, Gutierrez H, Hooper L, Elliott P, Cappuccio FP. Effect of increased potassium intake on cardiovascular risk factors and disease: systematic review and meta-analysis. BMJ. 2013 Apr 3.
9. Blumenthal JA, Babyak MA, Hinderliter A, et al. Effects of the DASH diet alone and in combination with exercise and weight loss on blood pressure and cardiovascular biomarkers in men and women with high blood pressure: the ENCORE study. Arch Intern Med. 2010 Jan 25; 170(2):126–35.
10. Piercy KL, Troiano RP, Ballard RM, et al. The physical activity guidelines for Americans. JAMA. 2018 Nov 20; 320(19):2020–8.
11. Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Hypertension. 2018 Jun; 71(6): e13–e115.
12. Unger T, et al. 2020 International Society of Hypertension Global Hypertension Practice Guidelines. Hypertension. 2020; 75:1334–1357. <https://www.ahajournals.org/doi/full/10.1161/HYPERTENSIONAHA.12015026> Accessed March 13, 2021.