[Request an Appointment](#)[Find a Doctor](#)[Find a Job](#)[Give Now](#)[Log in to Patient Account](#)[Patient Care & Health Information](#) > [Diseases & Conditions](#)

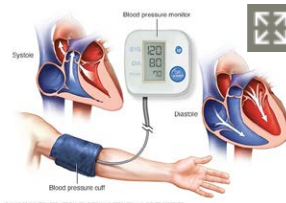
# High blood pressure (hypertension)

[Request an Appointment](#)[Symptoms & causes](#)[Diagnosis & treatment](#)[Doctors & departments](#)

## Diagnosis

[Advertisement](#)

To measure your blood pressure, your doctor or a specialist will usually place an inflatable arm cuff around your arm and measure your blood pressure using a pressure-measuring gauge.



### Blood pressure measurement

A blood pressure reading, given in millimeters of mercury (mm Hg), has two numbers. The first, or upper, number measures the pressure in your arteries when your heart beats (systolic pressure). The second, or lower, number measures the pressure in your arteries between beats (diastolic pressure).

Blood pressure measurements fall into four general categories:

- **Normal blood pressure.** Your blood pressure is normal if it's below 120/80 mm Hg.
- **Elevated blood pressure.** Elevated blood pressure is a systolic pressure ranging from 120 to 129 mm Hg and a diastolic pressure below 80 mm Hg. Elevated blood pressure tends to get worse over time unless steps are taken to control blood pressure.
- **Stage 1 hypertension.** Stage 1 hypertension is a systolic pressure ranging from 130 to 139 mm Hg or a

diastolic pressure ranging from 80 to 89 mm Hg.

- **Stage 2 hypertension.** More severe hypertension, stage 2 hypertension is a systolic pressure of 140 mm Hg or higher or a diastolic pressure of 90 mm Hg or higher.

Both numbers in a blood pressure reading are important. But after age 50, the systolic reading is even more significant. Isolated systolic hypertension is a condition in which the diastolic pressure is normal (less than 80 mm Hg) but systolic pressure is high (greater than or equal to 130 mm Hg). This is a common type of high blood pressure among people older than 65.

Your doctor will likely take two to three blood pressure readings each at three or more separate appointments before diagnosing you with high blood pressure. This is because blood pressure normally varies throughout the day, and it may be elevated during visits to the doctor (white coat hypertension).

Your blood pressure generally should be measured in both arms to determine if there is a difference. It's important to use an appropriate-sized arm cuff.

Your doctor may ask you to record your blood pressure at home to provide additional information and confirm if you have high blood pressure.

Your doctor may recommend a 24-hour blood pressure monitoring test called ambulatory blood pressure monitoring to confirm if you have high blood pressure. The device used for this test measures your blood pressure at regular intervals over a 24-hour period and provides a more accurate picture of blood pressure changes over an average day and night. However, these devices aren't available in all medical centers, and they may not be reimbursed.

If you have any type of high blood pressure, your doctor will review your medical history and conduct a physical examination.

Mayo Clinic does not endorse companies or products. Advertising revenue supports our not-for-profit mission.

#### Advertising & Sponsorship

[Policy](#) | [Opportunities](#) | [Ad Choices](#) 

### Mayo Clinic Marketplace

Check out these best-sellers and special offers on books and newsletters from Mayo Clinic.

[The Last Diet You'll Ever Need](#)

[Mayo Clinic on Healthy Aging](#)

[A New Perspective on Alzheimer's](#)

[Stop Osteoporosis in its Tracks](#)

[FREE TRIAL – Mayo Clinic Health Letter](#)

Advertisement

Your doctor may also recommend routine tests, such as a urine test (urinalysis), blood tests, a cholesterol test and an electrocardiogram — a test that measures your heart's electrical activity. Your doctor may also recommend additional tests, such as an echocardiogram, to check for more signs of heart disease.

## Taking your blood pressure at home

An important way to check if your blood pressure treatment is working, to confirm if you have high blood pressure, or to diagnose worsening high blood pressure, is to monitor your blood pressure at home.

Home blood pressure monitors are widely available and inexpensive, and you don't need a prescription to buy one. Home blood pressure monitoring isn't a substitute for visits to your doctor, and home blood pressure monitors may have some limitations.

Make sure to use a validated device, and check that the cuff fits. Bring the monitor with you to your doctor's office to check its accuracy once a year. Talk to your doctor about how to get started with checking your blood pressure at home.

Devices that measure your blood pressure at your wrist or finger aren't recommended by the American Heart Association.

## Treatment

Changing your lifestyle can go a long way toward controlling high blood pressure. Your doctor may recommend you make lifestyle changes including:

- Eating a heart-healthy diet with less salt
- Getting regular physical activity
- Maintaining a healthy weight or losing weight if you're overweight or obese

### Related information

[Heart disease risk calculator](#)

- Limiting the amount of alcohol you drink

But sometimes lifestyle changes aren't enough. In addition to diet and exercise, your doctor may recommend medication to lower your blood pressure.

Your blood pressure treatment goal depends on how healthy you are.

Your blood pressure treatment goal should be less than 130/80 mm Hg if:

- You're a healthy adult age 65 or older
- You're a healthy adult younger than age 65 with a 10 percent or higher risk of developing cardiovascular disease in the next 10 years
- You have chronic kidney disease, diabetes or coronary artery disease

Although 120/80 mm Hg or lower is the ideal blood pressure goal, doctors are unsure if you need treatment (medications) to reach that level.

If you're age 65 or older, and use of medications produces lower systolic blood pressure (such as less than 130 mm Hg), your medications won't need to be changed unless they cause negative effects to your health or quality of life.

The category of medication your doctor prescribes depends on your blood pressure measurements and your other medical problems. It's helpful if you work together with a team of medical professionals experienced in providing treatment for high blood pressure to develop an individualized treatment plan.

## Medications to treat high blood pressure

- **Thiazide diuretics.** Diuretics, sometimes called water pills, are medications that act on your kidneys to help your body eliminate sodium and water, reducing blood

volume.

Thiazide diuretics are often the first, but not the only, choice in high blood pressure medications. Thiazide diuretics include chlorthalidone, hydrochlorothiazide (Microzide) and others.

If you're not taking a diuretic and your blood pressure remains high, talk to your doctor about adding one or replacing a drug you currently take with a diuretic.

Diuretics or calcium channel blockers may work better for people of African heritage and older people than do angiotensin-converting enzyme (ACE) inhibitors alone. A common side effect of diuretics is increased urination.

- **Angiotensin-converting enzyme (ACE) inhibitors.**

These medications — such as lisinopril (Zestril), benazepril (Lotensin), captopril (Capoten) and others — help relax blood vessels by blocking the formation of a natural chemical that narrows blood vessels. People with chronic kidney disease may benefit from having an ACE inhibitor as one of their medications.

- **Angiotensin II receptor blockers (ARBs).** These medications help relax blood vessels by blocking the action, not the formation, of a natural chemical that narrows blood vessels. ARBs include candesartan (Atacand), losartan (Cozaar) and others. People with chronic kidney disease may benefit from having an ARB as one of their medications.

- **Calcium channel blockers.** These medications — including amlodipine (Norvasc), diltiazem (Cardizem, Tiazac, others) and others — help relax the muscles of your blood vessels. Some slow your heart rate. Calcium channel blockers may work better for older people and people of African heritage than do ACE inhibitors alone.

Grapefruit juice interacts with some calcium channel blockers, increasing blood levels of the medication and putting you at higher risk of side effects. Talk to your doctor or pharmacist if you're concerned about interactions.

## **Additional medications sometimes used to**

## treat high blood pressure

If you're having trouble reaching your blood pressure goal with combinations of the above medications, your doctor may prescribe:

- **Alpha blockers.** These medications reduce nerve impulses to blood vessels, reducing the effects of natural chemicals that narrow blood vessels. Alpha blockers include doxazosin (Cardura), prazosin (Minipress) and others.
- **Alpha-beta blockers.** In addition to reducing nerve impulses to blood vessels, alpha-beta blockers slow the heartbeat to reduce the amount of blood that must be pumped through the vessels. Alpha-beta blockers include carvedilol (Coreg) and labetalol (Trandate).
- **Beta blockers.** These medications reduce the workload on your heart and open your blood vessels, causing your heart to beat slower and with less force. Beta blockers include acebutolol (Sectral), atenolol (Tenormin) and others.

Beta blockers aren't usually recommended as the only medication you're prescribed, but they may be effective when combined with other blood pressure medications.

- **Aldosterone antagonists.** Examples are spironolactone (Aldactone) and eplerenone (Inspra). These drugs block the effect of a natural chemical that can lead to salt and fluid retention, which can contribute to high blood pressure.
- **Renin inhibitors.** Aliskiren (Tekturna) slows down the production of renin, an enzyme produced by your kidneys that starts a chain of chemical steps that increases blood pressure.

Aliskiren works by reducing the ability of renin to begin this process. Due to a risk of serious complications, including stroke, you shouldn't take aliskiren with ACE inhibitors or ARBs.

- **Vasodilators.** These medications, including hydralazine and minoxidil, work directly on the muscles in the walls of your arteries, preventing the muscles from tightening and

your arteries from narrowing.

- **Central-acting agents.** These medications prevent your brain from signaling your nervous system to increase your heart rate and narrow your blood vessels. Examples include clonidine (Catapres, Kapvay), guanfacine (Intuniv, Tenex) and methyldopa.

To reduce the number of daily medication doses you need, your doctor may prescribe a combination of low-dose medications rather than larger doses of one single drug. In fact, two or more blood pressure drugs often are more effective than one. Sometimes finding the most effective medication or combination of drugs is a matter of trial and error.

## **Resistant hypertension: When your blood pressure is difficult to control**

If your blood pressure remains stubbornly high despite taking at least three different types of high blood pressure drugs, one of which usually should be a diuretic, you may have resistant hypertension.

People who have controlled high blood pressure but are taking four different types of medications at the same time to achieve that control also are considered to have resistant hypertension. The possibility of a secondary cause of the high blood pressure generally should be reconsidered.

Having resistant hypertension doesn't mean your blood pressure will never get lower. In fact, if you and your doctor can identify what's behind your persistently high blood pressure, there's a good chance you can meet your goal with the help of treatment that's more effective.

Your doctor or hypertension specialist may:

- Evaluate potential causes of your condition and determine if those can be treated
- Review medications you're taking for other conditions and recommend you not take any that worsen your blood

pressure

- Recommend that you monitor your blood pressure at home to see if you may have higher blood pressure in the doctor's office (white coat hypertension)
- Suggest healthy lifestyle changes, such as eating a healthy diet with less salt, maintaining a healthy weight and limiting how much alcohol you drink
- Make changes to your high blood pressure medications to come up with the most effective combination and doses
- Consider adding an aldosterone antagonist such as spironolactone (Aldactone), which may lead to control of resistant hypertension

Some experimental therapies such as catheter-based radiofrequency ablation of renal sympathetic nerves (renal denervation) and electrical stimulation of carotid sinus baroreceptors are being studied.

If you don't take your high blood pressure medications exactly as directed, your blood pressure can pay the price. If you skip doses because you can't afford the medications, because you have side effects or because you simply forget to take your medications, talk to your doctor about solutions. Don't change your treatment without your doctor's guidance.



[Request an Appointment at Mayo Clinic](#)

## Clinical trials

[Explore Mayo Clinic studies](#) testing new treatments, interventions and tests as a means to prevent, detect, treat or manage this disease.

## Lifestyle and home remedies

Lifestyle changes can help you control and prevent high blood pressure, even if you're taking blood pressure medication.



Here's what you can do:

- **Eat healthy foods.** Eat a heart-healthy diet. Try the Dietary Approaches to Stop Hypertension (DASH) diet, which emphasizes fruits, vegetables, whole grains, poultry, fish and low-fat dairy foods. Get plenty of potassium, which can help prevent and control high blood pressure. Eat less saturated fat and trans fat.
- **Decrease the salt in your diet.** Aim to limit sodium to less than 2,300 milligrams (mg) a day or less. However, a lower sodium intake — 1,500 mg a day or less — is ideal for most adults.

While you can reduce the amount of salt you eat by putting down the saltshaker, you generally should also pay attention to the amount of salt that's in the processed foods you eat, such as canned soups or frozen dinners.

- **Maintain a healthy weight.** Keeping a healthy weight, or losing weight if you're overweight or obese, can help you control your high blood pressure and lower your risk of related health problems. In general, you may reduce your blood pressure by about 1 mm Hg with each kilogram (about 2.2 pounds) of weight you lose.
- **Increase physical activity.** Regular physical activity can help lower your blood pressure, manage stress, reduce your risk of several health problems and keep your weight under control.

Aim for at least 150 minutes a week of moderate aerobic activity or 75 minutes a week of vigorous aerobic activity, or a combination of moderate and vigorous activity. For example, try brisk walking for about 30 minutes most days of the week. Or try interval training, in which you alternate short bursts of intense activity with short recovery periods of lighter activity. Aim to do muscle-strengthening exercises at least two days a week.

- **Limit alcohol.** Even if you're healthy, alcohol can raise your blood pressure. If you choose to drink alcohol, do so in moderation. For healthy adults, that means 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.

Visited on 06/06/2018

- **Don't smoke.** Tobacco can injure blood vessel walls and speed up the process of buildup of plaque in the arteries. If you smoke, ask your doctor to help you quit.
- **Manage stress.** Reduce stress as much as possible. Practice healthy coping techniques, such as muscle relaxation, deep breathing or meditation. Getting regular physical activity and plenty of sleep can help, too.
- **Monitor your blood pressure at home.** Home blood pressure monitoring can help you keep closer tabs on your blood pressure, show if medication is working, and even alert you and your doctor to potential complications. Home blood pressure monitoring isn't a substitute for visits to your doctor, and home blood pressure monitors may have some limitations. Even if you get normal readings, don't stop or change your medications or alter your diet without talking to your doctor first.

If your blood pressure is under control, check with your doctor about how often you need to check it.

- **Practice relaxation or slow, deep breathing.** Practice taking deep, slow breaths to help relax. There are some devices available that promote slow, deep breathing. According to the American Heart Association, device-guided breathing may be a reasonable nondrug option for lowering blood pressure, especially when anxiety accompanies high blood pressure or standard treatments aren't well-tolerated.
- **Control blood pressure during pregnancy.** If you're a woman with high blood pressure, discuss with your doctor how to control your blood pressure during pregnancy.

## Alternative medicine

Although diet and exercise are the most appropriate tactics to lower your blood pressure, some supplements also may help lower it. However, more research is needed to determine the potential benefits. These include:

- Fiber, such as blond psyllium and wheat bran
- Minerals, such as magnesium, calcium and potassium

- Folic acid
- Supplements or products that increase nitric oxide or widen blood vessels (vasodilators), such as cocoa, coenzyme Q10, L-arginine or garlic
- Omega-3 fatty acids, found in fatty fish, high-dose fish oil supplements or flaxseed

Some research is studying whether vitamin D can reduce blood pressure, but more research is needed.

While it's best to include these supplements in your diet as foods, you can also take supplement pills or capsules. Talk to your doctor before adding any of these supplements to your blood pressure treatment. Some supplements can interact with medications, causing harmful side effects, such as an increased bleeding risk that could be fatal.

You can also practice relaxation techniques, such as deep breathing or meditation, to help you relax and reduce your stress level. These practices may temporarily reduce your blood pressure.

## Coping and support

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. To keep your blood pressure under control:

- **Take your medications properly.** If side effects or costs pose problems, don't stop taking your medications. Ask your doctor about other options.
- **Schedule regular doctor visits.** It takes a team effort to treat high blood pressure successfully. Your doctor can't do it alone, and neither can you. Work with your doctor to bring your blood pressure to a safe level, and keep it there.
- **Adopt healthy habits.** Eat healthy foods, lose excess weight and get regular physical activity. Limit alcohol. If you smoke, quit.

**Manage stress.** Say no to extra tasks, release negative thoughts, maintain good relationships, and remain patient and optimistic.

Sticking to lifestyle changes can be difficult, especially if you don't see or feel any symptoms of high blood pressure. If you need motivation, remember the risks associated with uncontrolled high blood pressure. It may help to enlist the support of your family and friends as well.

## Preparing for your appointment

If you think you may have high blood pressure, make an appointment with your family doctor to have your blood pressure checked.

No special preparations are necessary to have your blood pressure checked. You might want to wear a short-sleeved shirt to your appointment so that the blood pressure cuff can fit around your arm properly. Avoid eating, drinking caffeinated beverages and smoking right before your test. Plan to use the toilet before having your blood pressure measured.

Because some medications, such as over-the-counter cold medicines, pain medications, antidepressants, birth control pills and others, can raise your blood pressure, it might be a good idea to bring a list of medications and supplements you take to your doctor's appointment. Don't stop taking any prescription medications that you think may affect your blood pressure without your doctor's advice.

Because appointments can be brief, and because there's often a lot to discuss, it's a good idea to be prepared for your appointment. Here's some information to help you get ready for your appointment, and what to expect from your doctor.

## What you can do

- **Write down any symptoms you're experiencing.** High blood pressure seldom has symptoms, but it's a risk factor for heart disease. Letting your doctor know if you

Visited on 06/06/2018

have symptoms like chest pains or shortness of breath can help your doctor decide how aggressively your high blood pressure needs to be treated.

- **Write down key personal information**, including a family history of high blood pressure, high cholesterol, heart disease, stroke, kidney disease or diabetes, and any major stresses or recent life changes.
- **Make a list of all medications**, vitamins or supplements that you're taking.
- **Take a family member or friend along**, if possible. Sometimes it can be difficult to remember all the information provided to you during an appointment. Someone who accompanies you may remember something that you missed or forgot.
- **Be prepared to discuss** your diet and exercise habits. If you don't already follow a diet or exercise routine, be ready to talk to your doctor about any challenges you might face in getting started.
- **Write down questions to ask** your doctor.

Your time with your doctor is limited, so preparing a list of questions will help you make the most of your time together. List your questions from most important to least important in case time runs out. For high blood pressure, some basic questions to ask your doctor include:

- What kinds of tests will I need?
- Do I need any medications?
- What foods should I eat or avoid?
- What's an appropriate level of physical activity?
- How often do I need to schedule appointments to check my blood pressure?
- Should I monitor my blood pressure at home?
- What are the alternatives to the primary approach that you're suggesting?
- I have other health conditions. How can I best manage them together?

Are there any restrictions that I need to follow?

- Should I see a specialist?
- Is there a generic alternative to the medicine you're prescribing for me?
- Are there any brochures or other printed material that I can take home with me?
- What websites do you recommend visiting?

In addition to the questions that you've prepared to ask your doctor, don't hesitate to ask questions during your appointment at any time that you don't understand something.

## What to expect from your doctor

Your doctor is likely to ask you a number of questions. Being ready to answer them may reserve time to go over any points you want to spend more time on. Your doctor may ask:

- Do you have a family history of high cholesterol, high blood pressure or heart disease?
- What are your diet and exercise habits like?
- Do you drink alcohol? How many drinks do you have in a week?
- Do you smoke?
- When did you last have your blood pressure checked? What was your blood pressure measurement then?


## What you can do in the meantime

It's never too early to make healthy lifestyle changes, such as quitting smoking, eating healthy foods and becoming more physically active. These are primary lines of defense against high blood pressure and its complications, including heart attack and stroke.

By Mayo Clinic Staff



 **Request an Appointment at Mayo Clinic**

 [Symptoms & causes](#)

[Doctors & departments](#) 

Share on:  Facebook  Twitter  Print May 12, 2018

References 

---

## Related

- [Angiotensin II receptor blockers](#)
- [Stress and high blood pressure](#)
- [Calcium channel blockers](#)
- [Blood pressure: Does it have a daily pattern?](#)
- [Central-acting agents](#)
- [Alcohol: Does it affect blood pressure?](#)
- [How to measure blood pressure using an automatic monitor](#)
- [Hypertensive crisis: What are the symptoms?](#)
- [White coat hypertension](#)
- [Medications and supplements that can raise your blood pressure](#)
- [Blood pressure chart](#)
- [What's your high blood pressure risk?](#)
- [Blood pressure tip: Get more potassium](#)
- [Do you know your blood pressure?](#)
- [Resperate: Can it help reduce blood pressure?](#)
- [Blood pressure medications: Can they raise my triglycerides?](#)
- [Blood pressure tip: Know alcohol limits](#)
- [Blood pressure readings: Why higher at home?](#)
- [Medication-free hypertension control](#)
- [Calcium supplements: Do they interfere with blood pressure drugs?](#)
- [Wrist blood pressure monitors: Are they accurate?](#)
- [Home blood pressure monitoring](#)

[High blood pressure and sex](#)

[Angiotensin-converting enzyme \(ACE\) inhibitors](#)

[Alpha blockers](#)

[Isolated systolic hypertension: A health concern?](#)

[How to measure blood pressure using a manual monitor](#)

[Blood pressure: Can it be higher in one arm?](#)

[Diuretics: A cause of low potassium?](#)

[Beta blockers: How do they affect exercise?](#)

[Healthy eating: One step at a time](#)

[Vasodilators](#)

[Can whole-grain foods lower blood pressure?](#)

[Blood pressure medication: Still necessary if I lose weight?](#)

[Pulse pressure: An indicator of heart health?](#)

[Blood pressure tip: Stress out no more](#)

[Blood pressure tip: Get off the couch](#)

[High blood pressure and cold remedies: Which are safe?](#)

[Free blood pressure machines: Are they accurate?](#)

[What is blood pressure?](#)

[Choosing blood pressure medications](#)

[High blood pressure and exercise](#)

[Fruit: To peel or not to peel?](#)

[Caffeine and hypertension](#)

[Beta blockers: Do they cause weight gain?](#)

[High blood pressure: Can you prevent it?](#)

[Blood pressure: Is it affected by cold weather?](#)

[Anxiety: A cause of high blood pressure?](#)

[Menopause and high blood pressure: What's the connection?](#)

[Sleep deprivation: A cause of high blood pressure?](#)

[Blood pressure tip: Watch the caffeine](#)

[Blood pressure tip: Watch your weight](#)

[Beta blockers](#)

[Blood pressure cuff: Does size matter?](#)

[Weightlifting: Bad for your blood pressure?](#)



[L-arginine: Does it lower blood pressure?](#)

[Diuretics](#)

[High blood pressure dangers](#)

[Picnic Problems: High Sodium](#)

[DASH diet](#)

[Heart disease risk calculator](#)

[Birth control pill FAQ](#)

[Is chocolate healthy?](#)

[Adrenal Nodule Create Health Risks](#)

[Water softeners and sodium](#)

[Supplements and heart drugs](#)

[DASH diet tips](#)

[DASH diet](#)

[Video: Heart and circulatory system](#)

[Polypill: Does it treat heart disease?](#)

[After a flood, are food and medicines safe to use?](#)

[Sodium: Smarten up](#)

[Do infrared saunas have any health benefits?](#)

[Sample DASH menus](#)

[Symptom Checker](#)

[Sleep tips](#)

[DASH recommended servings](#)

[Vegetable recipes](#)

[Diuretics: Cause of gout?](#)

[Nosebleeds](#)

---

## High blood pressure (hypertension)

---

### Symptoms & causes

---

### Diagnosis & treatment

---

### Doctors & departments



- [Request Appointment](#) | [Contact Us](#)
- [About Mayo Clinic](#) | [Employees](#) | [Find a Job](#)
- [Site Map](#) | [About This Site](#)



Mayo Clinic is a not-for-profit organization. Make a donation.

### PATIENT CARE & HEALTH INFO

- [Healthy Lifestyle](#)
- [Symptoms A-Z](#)
- [Diseases and Conditions A-Z](#)
- [Tests and Procedures A-Z](#)
- [Drugs and Supplements A-Z](#)
- [Appointments](#)
- [Patient and Visitor Guide](#)
- [Billing and Insurance](#)
- [Patient Online Services](#)

### DEPARTMENTS & CENTERS

- [Doctors and Medical Staff](#)
- [Medical Departments and Centers](#)
- [Research Centers and Programs](#)
- [About Mayo Clinic](#)
- [Contact Us](#)

### RESEARCH

- [Explore Research Labs](#)
- [Find Clinical Trials](#)
- [Research Faculty](#)
- [Postdoctoral Fellowships](#)
- [Discovery's Edge Magazine](#)
- [Search Publications](#)
- [Training Grant Positions](#)

### EDUCATION

- [Mayo Clinic College of Medicine and Science](#)
- [Mayo Clinic Graduate School of Biomedical Sciences](#)
- [Mayo Clinic School of Medicine](#)
- [Mayo Clinic School of Continuous Professional Development](#)
- [Mayo Clinic School of Graduate Medical Education](#)
- [Mayo Clinic School of Health Sciences](#)
- [Alumni Center](#)

### FOR MEDICAL PROFESSIONALS

- [Provider Relations](#)
- [Referring Physician Portal](#)
- [AskMayoExpert](#)
- [Video Center](#)
- [Publications](#)
- [Continuing Medical Education](#)
- [Mayo Medical Laboratories](#)

### PRODUCTS & SERVICES

- [Healthy Living Program](#)
- [Sports Medicine](#)
- [Books and more - Mayo Clinic Marketplace](#)
- [Mayo Clinic Health Letter](#)
- [Medical Products](#)
- [Population Health and Wellness Programs](#)
- [Medical Laboratory Services](#)
- [Mayo Clinic Voice Apps](#)

Any use of this site constitutes your agreement to the [Terms and Conditions](#) and [Privacy Policy](#) linked below.

- [Terms and Conditions](#)
- [Privacy Policy](#)
- [Notice of Privacy Practices](#)
- [Notice of Nondiscrimination](#)
- [Manage Cookies](#)

A single copy of these materials may be reprinted for noncommercial personal use only. "Mayo," "Mayo Clinic," "MayoClinic.org," "Mayo Clinic Healthy Living," and the triple-shield Mayo Clinic logo are trademarks of Mayo Foundation for Medical Education and Research.



This site complies with the HONcode standard for trustworthy health information: [verify here.](#)

