**PERIPHERAL ARTERY DISEASE**

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**About Peripheral Artery Disease (PAD)**

PAD is similar to coronary artery disease (CAD)

Peripheral artery disease is a narrowing of the peripheral arteries serving the legs, stomach, arms and head. (“Peripheral” in this case means away from the heart, in the outer regions of the body.) PAD most commonly affects arteries in the legs.

Both PAD and [coronary artery disease](https://www.heart.org/en/health-topics/consumer-healthcare/what-is-cardiovascular-disease/coronary-artery-disease) (CAD) are caused by atherosclerosis. Atherosclerosis narrows and blocks arteries in critical regions of the body.

**Quick facts about PAD**

The most common symptoms of PAD involving the lower extremities are cramping, pain or tiredness in the leg or hip muscles while walking or climbing stairs. Typically, this pain goes away with rest and returns when you walk again.

**Be aware that:**

* Many people mistake the symptoms of PAD for something else.
* PAD often goes undiagnosed by healthcare professionals.
* People with peripheral arterial disease have a higher risk of coronary artery disease, heart attack or stroke.
* Left untreated, PAD can lead to gangrene and amputation.

**Added risks for PAD**

Other factors can increase your chances for peripheral artery disease, including:

* Your risk for peripheral artery disease increases with age.
* [High blood pressure](https://www.heart.org/en/health-topics/high-blood-pressure/the-facts-about-high-blood-pressure) or [high cholesterol](https://www.heart.org/en/health-topics/cholesterol/about-cholesterol) puts you at risk for PAD.
* [If you smoke](https://www.heart.org/en/healthy-living/healthy-lifestyle/quit-smoking-tobacco), you have an especially high risk for PAD.
* If you have [diabetes](https://www.heart.org/en/health-topics/diabetes/about-diabetes), you have an especially high risk for PAD.

The good news

If you’re at risk for peripheral artery disease or have been diagnosed with PAD, it’s worth knowing that:

* [PAD is easily diagnosed](https://www.heart.org/en/health-topics/peripheral-artery-disease/symptoms-and-diagnosis-of-pad) in a simple, painless way.
* You can take control: Follow your doctor’s recommendations and strive to lead a heart-healthy lifestyle.
* Some cases of PAD can be managed with [lifestyle changes and medication](https://www.heart.org/en/health-topics/peripheral-artery-disease/prevention-and-treatment-of-pad).

**Atherosclerosis and PAD**

If you have [atherosclerosis](https://www.heart.org/en/health-topics/cholesterol/about-cholesterol/atherosclerosis), that means that plaque has built up inside your artery walls. Plaque is made up of deposits of fats, cholesterol and other substances. Atherosclerosis in the peripheral arteries is the most common cause of PAD.

To see how plaque limits blood flow, [view our interactive PAD library](https://watchlearnlive.heart.org/CVML_Player.php?moduleSelect=periad).

What happens is this: First, plaque builds up enough to narrow an artery, which chokes off blood flow. Next, if that plaque becomes brittle or inflamed, it may rupture, triggering a blood clot to form. A clot can further narrow the artery, or completely block it.

If that blockage remains in the peripheral arteries of the legs, it can cause pain, changes in skin color, difficulty walking and sores or ulcers. Total loss of circulation to the legs and feet can cause gangrene and the loss of a limb.

If the blockage occurs in a carotid artery, it can cause a stroke.

It’s important to learn the facts about PAD. As with any disease, the more you understand, the more you’ll be able to help your doctor make an early diagnosis. PAD has common symptoms, but many people with PAD never have any symptoms at all.

Learn the facts, talk to your doctor and take control of your cardiovascular health.

**WHY PAD MATTERS**

Why does peripheral artery disease (PAD) matter?

Peripheral artery disease happens when fatty deposits build up in arteries outside the heart, usually the arteries supplying fresh oxygen and blood to the arms, legs and feet.

**Is PAD dangerous or life threatening?**

Yes, PAD is dangerous because these blockages can restrict circulation to the limbs, organs and brain. Without adequate blood flow, vital organs, legs, arms and feet, and your brain, suffer damage. Left untreated, the tissue can become infected or die, a condition called gangrene.

**Does PAD cause additional health problems?**

PAD may be the first warning sign of [atherosclerosis](https://www.heart.org/en/health-topics/cholesterol/about-cholesterol/atherosclerosis) – chronic fatty deposit build-ups – throughout your arteries. The whole circulatory system, including your heart and brain, are at risk when arteries are blocked and narrowed. Fatty deposits also increase the risk for vascular inflammation and blood clots that can block the blood supply and cause tissue death.

PAD is potentially a life-threatening condition that can be [managed or even reversed with proper care](https://www.heart.org/en/health-topics/peripheral-artery-disease/prevention-and-treatment-of-pad).

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**UNDERSTAND YOUR RISK FOR PAD**

People who [smoke](https://www.heart.org/en/healthy-living/healthy-lifestyle/quit-smoking-tobacco) and/or have [diabetes](https://www.heart.org/en/health-topics/diabetes) are at especially high risk. If you have risk factors for peripheral artery disease (PAD), get screened for PAD, even if you're not having symptoms.

**PAD risk factors you can control**

Certain risk factors for PAD can't be controlled. These uncontrollable risk factors include aging, personal or family history of PAD, [cardiovascular disease](https://www.heart.org/en/health-topics/consumer-healthcare/what-is-cardiovascular-disease/coronary-artery-disease) or [stroke(link opens in new window)](http://www.strokeassociation.org/). However, you can control the following risk factors:

* Cigarette smoking - You can stop smoking. Smoking is a major risk factor for PAD. Smokers may have four times the risk of PAD than nonsmokers. Our guide to [quitting smoking](https://www.heart.org/en/healthy-living/healthy-lifestyle/quit-smoking-tobacco) can help you.
* Diabetes mellitus - You can manage diabetes and blood sugar levels. Having diabetes puts you at greater risk of developing PAD as well as other cardiovascular diseases. Learn more about the risks and [how to manage diabetes](https://www.heart.org/en/health-topics/diabetes/prevention--treatment-of-diabetes).
* High blood pressure - You can manage your blood pressure. It's sometimes called "the silent killer" because it has no symptoms. Work with your healthcare professionals to [monitor and control your blood pressure](https://www.heart.org/en/health-topics/high-blood-pressure/why-high-blood-pressure-is-a-silent-killer).
* High blood cholesterol - You can manage your cholesterol levels. High cholesterol contributes to the build-up of plaque in the arteries, which can significantly reduce the blood's flow. This condition is known as atherosclerosis. [Managing your cholesterol levels](https://www.heart.org/en/health-topics/cholesterol/prevention-and-treatment-of-high-cholesterol-hyperlipidemia) is essential to prevent or treat PAD.
* Obesity - You can reduce your weight. People with a Body Mass Index (BMI) of 25 or higher are more likely to develop heart disease and stroke even if they have no other risk factors. Calculate your BMI and learn [healthy ways to manage your weight](https://www.heart.org/en/healthy-living/healthy-eating/losing-weight).
* Physical inactivity - You can get moving. Physical activity increases the distance that people with PAD can walk without pain and also helps decrease the risk of heart attack or stroke. [Supervised exercise programs](https://www.heart.org/en/health-topics/peripheral-artery-disease/prevention-and-treatment-of-pad) are one of the treatments for PAD patients.

You can choose more than one target to improve! Taking care of only one risk factor is not as effective as taking care of all those that you can control.

Learn the facts. Develop a heart-healthy lifestyle and cooperate with your healthcare professionals. Your heart will thank you by functioning better and lasting longer.

**SYMPTOMS AND DIAGNOSIS OF PAD**

The most common symptom of peripheral artery disease (PAD) in the lower extremities is a painful muscle cramping in the hips, thighs or calves when walking, climbing stairs or exercising.

The pain of PAD often goes away when you stop exercising, although this may take a few minutes. Working muscles need more blood flow. Resting muscles can get by with less.

If there's a blood-flow blockage due to plaque buildup, the muscles won't get enough blood during exercise to meet the needs. The "crampy" pain (called "intermittent claudication"), when caused by PAD, is the muscles' way of warning the body that it isn't receiving enough blood during exercise to meet the increased demand.

Many people with PAD have no symptoms or mistake their symptoms for something else.

**Other symptoms of PAD include:**

* **Leg pain** that does not go away when you stop exercising
* Foot or toe **wounds** that won't heal or heal very slowly
* Gangrene, or dead tissue
* A marked **decrease in the temperature** of your lower leg or foot particularly compared to the other leg or to the rest of your body
* Poor nail growth on the toes or hair growth on the legs
* Erectile dysfunction, especially in men with diabetes

**Understanding leg pain**

Many people dismiss leg pain as a normal sign of aging. You may think it's arthritis, sciatica or just "stiffness" from getting older. For an accurate diagnosis, consider the source of your pain. PAD leg pain occurs in the muscles, not the joints.

Those with [diabetes](https://www.heart.org/en/health-topics/diabetes/about-diabetes) might confuse PAD pain with a neuropathy, a common diabetic symptom that is a burning or painful discomfort of the feet or thighs. If you're having any kind of recurring pain, talk to your healthcare professional and describe the pain as accurately as you can. **If you have any of the**[**risk factors for PAD**](https://www.heart.org/en/health-topics/peripheral-artery-disease/understand-your-risk-for-pad)**, you should ask your healthcare professional about PAD even if you aren't having symptoms.**

**Diagnosing PAD**

PAD diagnosis begins with a physical examination. Your healthcare provider will ask about symptoms you may be experiencing.

Your healthcare provider will check for weak pulses in the legs. Your physical examination may include the following:

* **Ankle-brachial index (ABI):**a painless exam that compares the blood pressure in your feet to the blood pressure in your arms to determine how well your blood is flowing. This inexpensive test takes only a few minutes and can be performed by your healthcare professional as part of a routine exam. Normally, the ankle pressure is at least 90 percent of the arm pressure, but with severe narrowing it may be less than 50 percent.

If an ABI reveals an abnormal ratio between the blood pressure of the ankle and arm, you may need more testing. Your doctor may recommend one of these other tests.

* **Doppler and Ultrasound (Duplex) imaging:** a non-invasive method that visualizes the artery with sound waves and measures the blood flow in an artery to indicate the presence of a blockage.
* **Computed Tomographic Angiography (CT):** a non-invasive test that can show the arteries in your abdomen, pelvis and legs. This test is particularly useful in patients with pacemakers or stents.
* **Magnetic Resonance Angiography (MRA):** a non-invasive test that gives information similar to that of a CT without using X-rays.
* **Angiography:** During an angiogram, also called an arteriogram, a contrast agent is injected into the artery and X-rays are taken to show blood flow, arteries in the legs and to pinpoint any blockages that may be present. Learn more about [peripheral angiogram](https://www.heart.org/en/health-topics/peripheral-artery-disease/symptoms-and-diagnosis-of-pad/peripheral-angiogram).

As stated earlier, PAD often goes undiagnosed. Untreated PAD can be dangerous because it can lead to painful symptoms or loss of a leg, and patients with PAD have an increased risk of [coronary artery disease](https://www.heart.org/en/health-topics/consumer-healthcare/what-is-cardiovascular-disease/coronary-artery-disease), [stroke](http://www.strokeassociation.org/) and [heart attack](https://www.heart.org/en/health-topics/heart-attack). Because people with PAD have this increased risk for [heart attack](https://www.heart.org/en/health-topics/heart-attack) and [stroke](http://www.strokeassociation.org/), the American Heart Association encourages people at risk to discuss PAD with their healthcare professional to ensure early diagnosis and treatment.

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**PREVENTION AND TREATMENT OF PAD**

Treatment for [peripheral artery disease](https://www.heart.org/en/health-topics/peripheral-artery-disease/about-peripheral-artery-disease-pad) (PAD) focuses on reducing symptoms and preventing further progression of the disease. In most cases, lifestyle changes, exercise and claudication medications are enough to slow the progression or even reverse the symptoms of PAD.

**Physical Activity**

An often effective treatment for PAD symptoms is regular physical activity. Your doctor may recommend a program of supervised exercise training for you, also known as cardiac rehabilitation. You may have to begin slowly, but simple walking regimens, leg exercises and treadmill exercise programs can ease symptoms. Exercise for intermittent claudication - poor circulation in leg arteries due to buildup of plaque - takes into account the fact that walking causes pain. The program consists of alternating activity and rest in intervals to build up the amount of time you can walk before the pain sets in. It's best if this exercise program is undertaken in a rehabilitation center on a treadmill and monitored. If it isn’t possible to go to a rehabilitation center, your healthcare professional may recommend a structured community or home-based program that's best suited to your situation.

**Diet**

Many PAD patients have elevated [cholesterol levels](https://www.heart.org/en/health-topics/cholesterol/about-cholesterol/what-your-cholesterol-levels-mean). A diet low in saturated and trans fat can help [lower blood cholesterol levels](https://www.heart.org/en/health-topics/cholesterol/prevention-and-treatment-of-high-cholesterol-hyperlipidemia), but cholesterol-lowering medication may be necessary to maintain the proper cholesterol levels.

**Smoking Cessation**

Tobacco smoke is a major risk factor for PAD and your risk for heart attack and stroke. Stop smoking. It will help to slow the progression of PAD and other heart-related diseases.

**Medication**

* You may be prescribed [high blood pressure medications](https://www.heart.org/en/health-topics/high-blood-pressure/changes-you-can-make-to-manage-high-blood-pressure/what-you-should-know-about-high-blood-pressure-and-medications) and/or [cholesterol-lowering medications](https://www.heart.org/en/health-topics/cholesterol/prevention-and-treatment-of-high-cholesterol-hyperlipidemia/cholesterol-medications). It's important to make sure that you take the medication as recommended by your healthcare professional. Not following directions increases your risk for PAD, as well as heart attack and stroke.
* In addition, you may be prescribed medications to help prevent blood clots.

**Managing Diabetes**

Working with a coordinated healthcare team and making the lifestyle changes necessary to best manage [diabetes](https://www.heart.org/en/health-topics/diabetes) may help reduce limb-related complications.

**Procedures**

For a minority of patients the above recommendations and treatments aren't enough, and minimally invasive treatment or surgery may be needed. [Angioplasty](http://watchlearnlive.heart.org/CVML_Player.php?moduleSelect=angiop) or [stent placement](http://watchlearnlive.heart.org/CVML_Player.php?moduleSelect=cstent) (as is done in the heart for [coronary artery disease (CAD)](https://www.heart.org/en/health-topics/consumer-healthcare/what-is-cardiovascular-disease/coronary-artery-disease) are nonsurgical and are performed by making a small incision through which a catheter is inserted to reach the blocked artery. A tiny balloon is inflated inside the artery to open the clog. A stent — a tiny wire mesh cylinder — may also be implanted at this time to help hold the artery open. Sometimes a medicine can be given through the catheter or a special device can be inserted through it to remove a clot that's blocking the artery. Atherectomy is a procedure to remove plaque from the artery.

If there's a long portion of artery in your leg that's completely blocked and you're having severe symptoms, surgery may be necessary. A vein from another part of the body can be used to “bypass” and reroute blood around the closed artery. Your healthcare professional will discuss your options and help choose the best procedure for your situation.

**Clinical Trials**

Clinical trials are scientific studies that determine if a possible new medical advance can help people and whether it has harmful side effects. Find answers to common questions about clinical trials in our [Guide to Understanding Clinical Trials](https://www.heart.org/en/health-topics/consumer-healthcare/doctor-appointments-questions-to-ask-your-doctor/a-guide-to-understanding-clinical-trials).