

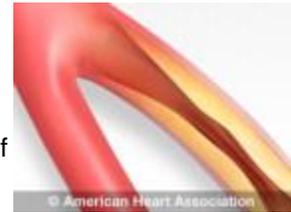
# PERIPHERAL ARTERY DISEASE

## About Peripheral Artery Disease

PAD is a narrowing of the peripheral arteries, most commonly in the arteries of the pelvis and legs. PAD is similar to coronary artery disease (CAD) and carotid artery disease. All three of these conditions are caused by narrowed and blocked arteries in various critical regions of the body. Hardened arteries (or atherosclerosis) in the coronary artery region, restricts the blood supply to the heart muscle. Carotid artery disease refers to atherosclerosis in the arteries that supply blood to the brain.

The most common symptoms of PAD 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.

- Many people mistake the symptoms of PAD for something else.
- PAD often goes undiagnosed by healthcare professionals.
- People with peripheral arterial disease have four to five times more risk of heart attack or stroke.
- Left untreated, PAD can lead to gangrene and amputation.



Added risks for PAD:

- If you smoke, you have an especially high risk for PAD.
- If you have diabetes, you have an especially high risk for PAD.
- People with high blood pressure or high cholesterol are at risk for PAD.

The good news for PAD patients:

- PAD is easily diagnosed in a simple, painless way.
- You can take control by leading a heart-healthy lifestyle and following the recommendations of your healthcare professional.
- Most cases of PAD can be managed with lifestyle changes and medication.

## **Atherosclerosis and PAD**

Atherosclerosis is a disease in which plaque builds up in the wall of an artery. PAD is usually caused by atherosclerosis in the peripheral arteries (or outer regions away from the heart). Plaque is made up of deposits of fats, cholesterol and other substances. Plaque formations can grow large enough to significantly reduce the blood's flow through an artery. When a plaque formation becomes brittle or inflamed, it may rupture, triggering a blood clot to form. A clot may either further narrow the artery, or completely block it.

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

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If the blockage occurs in a coronary artery, it can cause a heart attack. Heart attacks happen when an area of the heart tissue dies from lack of blood flow. When it 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 likely you'll be able to help your healthcare professional make an early diagnosis and start treatment. PAD has common symptoms, but many people with PAD never have any symptoms at all.

## Why does peripheral artery disease 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 and organs. Without adequate blood flow, the kidneys, legs, arms and feet suffer damage. Left untreated, the tissue can die or harbor infection such as gangrene.

## Does PAD cause additional health problems?

PAD may be the first warning sign of [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 a life-threatening condition that can be managed or even reversed with proper care.

People who [smoke](#) and/or have [diabetes](#) are at especially high risk. If you have risk factors for 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 or stroke. 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 can help you.
- **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..
- **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.

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- **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.
- **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 is essential to prevent or treat PAD.
- **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.

## Symptoms of PAD

The most common symptom of PAD is a painful muscle cramping in the hips, thighs or calves when walking, climbing stairs or exercising.

The pain of PAD usually 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

Symptoms of severe 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
- 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

## 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](#) 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, you should ask your healthcare professional about PAD even if you aren't having symptoms.

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## Diagnosing PAD

PAD diagnosis begins with a physical examination.

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: (generally reserved for use in conjunction with vascular treatment procedures) During an angiogram, 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](#).

As stated earlier, PAD often goes undiagnosed. Untreated PAD can be dangerous because it can lead to painful symptoms, loss of a leg, increased risk of coronary artery disease and stroke, the American Heart Association encourages people at risk to discuss PAD with their healthcare professional to ensure early diagnosis and treatment.

Treatment for 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

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## Treatment of PAD

### Physical Exercise

The most effective treatment for PAD is regular physical activity. Your doctor may recommend a program of supervised exercise training for you. You may have to begin slowly, but simple walking regimens, leg exercises and treadmill exercise programs three times a week can result in decreased symptoms in just four to eight weeks. Exercise for intermittent claudication 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, ask your healthcare professional to help you plan a program that's best suited to your situation.

Many PAD patients have elevated cholesterol levels. A diet low in saturated fat, *trans* fat and cholesterol can help lower blood cholesterol levels, but cholesterol-lowering medication may be necessary to maintain the proper cholesterol levels.

Tobacco smoke greatly increases your risk for PAD and your risk for heart attack and stroke. Smokers may have four times the risk of developing PAD than nonsmokers. Stop smoking. It will help to slow the progression of PAD and other heart-related diseases.

- You may be prescribed high blood pressure medications and/or cholesterol lowering 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.
- Medications that your doctor may prescribe to help improve the distance you can walk include cilostazol and pentoxifylline.
- In addition, you may be prescribed antiplatelet medications (aspirin and clopidogrel also know by the brand name Plavix<sup>®</sup>) to help prevent blood clots.
- For a minority of patients the above recommendations and treatments aren't enough, and minimally invasive treatment or surgery may be needed. Minimally invasive procedures consist of angioplasty or stent placement (as is done in the heart for coronary artery disease (CAD) or clot-removal treatment. They 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.
- 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.