

Peripheral Arterial Disease (PAD)

Fact Sheet

Facts about PAD in the United States

- According to the National Institutes of Health, between 8 million and 12 million Americans have PAD.
- Among adults age 65 and older, 12 to 20 percent may have PAD.
- Approximately 85 percent of all amputations occur in people over the age of 60.
- One in three people over the age of 50 with diabetes is likely to have PAD.
- Each year, more than 160,000 lower-limb amputations are performed. Of all lower-limb amputations, more than 60 percent occur among people with diabetes.
- 49 percent of people who receive an amputation have never had a diagnostic angiogram to determine if blood flow could be restored.

Background

Peripheral Arterial Disease, or PAD, is a life-threatening condition where a fatty material called plaque builds up on the inside walls of the blood vessels that carry blood from the heart to the legs and arms.

The buildup of plaque causes the arteries to harden and narrow (which is called atherosclerosis), and blood flow to the legs is reduced.

People with PAD may also have hardened and narrowed arteries to the heart and brain, and thus have an increased risk for heart attack and stroke.

Lower extremity PAD may provide an early warning sign of vascular disease throughout the body.

PAD patients have a six to seven times greater risk of coronary artery disease, heart attack, stroke or transient ischemic attack (“mini stroke”) than the rest of the population.

Symptoms

The most common PAD symptoms include one or more of these problems:

- Claudication, which is leg pain that occurs when walking or exercising and disappears when the person stops the activity.
- Leg muscle fatigue, leg cramping, coldness in the lower legs and feet, or numbness.
- Foot or toe pain at rest that often disturbs sleep.
- Wounds on the feet or toes that are slow to heal.
- In severe cases of PAD, called Critical Limb Ischemia, the lack of blood flow to the extremity can lead to ulcers or sores that don't heal.
- If ulcers or sores are left untreated, these non-healing wounds could lead to amputation of a toe, foot or leg.

PAD Risk Factors

The following risk factors can increase the risk of developing PAD:

- **Smoking.** Smoking, which is more closely related to developing PAD than any other risk factor — increases the risk of developing PAD three to five times.
- **Diabetes.** One in three people over age 50 with diabetes is likely to have PAD. The rate of amputation for people with diabetes is 10 times higher than for people without diabetes.
- **Age.** The risk of PAD also increases with age. People over the age of 50 have a higher risk of PAD, and among adults age 65 and older, 12 to 20 percent may have PAD.
- **Leg pain.** Pain, cramps, a tired feeling or heaviness in the legs when exercising may be a sign of poor circulation in the legs, which may be caused by PAD.
- **High blood pressure.**
- **Abnormal cholesterol levels.**
- **Personal history of heart disease, a heart attack or a stroke.**

Diagnosing PAD

Many people simply live with their leg or foot pain and assume it is a normal part of aging. In fact, they may have PAD and could benefit from a proper diagnosis and treatment strategy.

A PAD diagnostic workup starts with a medical history, including a review of risk factors and symptoms associated with PAD. A physical examination of the feet and leg blood flow is also performed to assist in determining if PAD is present. However, a history and exam alone are not enough.

- Only about 10 percent of people with PAD have the classic symptoms of claudication (leg pain).
- Pulse examination may falsely indicate the true blood flow. Therefore diagnosing PAD accurately also requires an ankle-brachial index (ABI) test.

The ABI test is simple, noninvasive and only takes about 10 minutes.

- An ABI determines how well the blood is flowing by comparing the highest ankle systolic blood pressure with the highest brachial (arm) systolic blood pressure.
- A ratio of 1.0 – 1.29 suggests normal arterial health. A result of 0.91 – 0.99 indicates a borderline case of PAD, whereas 0.41 – 0.90 denotes mild to moderate PAD. Severe PAD can be found in patients with an ABI result of less than 0.40.

If the ABI reveals an abnormal ratio (1.3 or greater), one of the following tests may be recommended:

- **Toe pressure.** A substitute for ABI when assessing blood flow in patients with calcification in the ankles.
- **Segmental pressures and pulse volume recordings.** Measures pressure at levels in the ankle, calf and thigh.
- **Doppler and ultrasound (duplex) imaging.** Visualizes the artery with sound waves and measures the blood flow in an artery to indicate the presence of blockage.
- **Computed Tomographic Angiography (CTA).** Shows the arteries in the abdomen, pelvis and legs using x-ray and a contrast agent.
- **Magnetic Resonance Angiography (MRA).** Provides information similar to that of a CT without use of x-rays. An MRA is useful in selecting candidates for interventional treatment.
- **Angiography.** Invasive test that pinpoints the exact location of blockages in the limb. An x-ray is taken after injecting dye into an artery. This test is usually reserved for use with treatment.

PAD Treatment

Treatment for PAD depends on an overall diagnostic assessment, including patient symptoms and risk factors, the site and severity of the arterial blockages, and results of diagnostic tests. The overall goal for treating PAD is to reduce the effects of symptoms; improve walking ability; save limbs; and lower the risk of heart attack and stroke.

Specific treatments for PAD include:

Lifestyle Changes

- Quitting smoking.
- Lowering blood pressure to less than 140/90 mmHg or less than 130/80 mmHg for diabetics.
- Lowering LDL (bad) cholesterol to less than 100 mg/dl to delay or even reverse the buildup of plaque in the arteries.
- Managing diabetes to lower blood glucose levels.
- Following a healthy eating plan that reduces salt and fat intake, and includes more fruits, vegetables and low-fat dairy products.
- Getting regular exercise such as walking for 30 minutes at least three or four times a week.

Medication

Medications may be prescribed to:

- Lower high cholesterol and high blood pressure.
- Thin the blood to prevent clots from forming due to low blood flow.
- Dissolve blood clots.
- Help improve walking ability and decrease pain in the legs (claudication).

If PAD progresses and symptoms cannot be controlled by lifestyle changes or medications, various procedures can be performed such as:

Angioplasty

Angioplasty is a procedure where a balloon is inflated and plaque is pushed against the arterial walls, causing the artery to widen, potentially restoring blood flow through a blocked artery.

Stent

A stent (tiny metal cylinder) is often placed in the artery after the angioplasty procedure with the intent to keep the diseased artery open.

Vascular Bypass Surgery

Surgery may be necessary if blood flow through a limb is almost or completely blocked.

In vascular surgery, a blood vessel from another part of the body or a tube made of synthetic material is used to bypass blockages in the artery. This allows blood to flow around the blockage and into the lower limb.

Atherectomy

Atherectomy is a procedure to remove or debulk the built up plaque from the blood vessel.

As in angioplasty, an ultra-thin wire is threaded through a catheter into the artery and across the blockage.

Several types of devices may then be used to remove plaque.

Orbital Atherectomy

Orbital atherectomy uses a small, diamond-coated crown that is designed to remove even the toughest kind of plaque without damaging the arteries, potentially offering new hope to patients with disease or calcified plaque in small arteries.

Unlike other atherectomy technologies, orbital technology is designed to optimize treatment in the arteries of the lower leg or below-the-knee (BTK), including calcified lesions, giving people with PAD a new treatment alternative.

After an atherectomy procedure, balloon angioplasty may be used to further open the artery and a stent may be inserted for added vessel wall reinforcement

Information Sources

American Diabetes Association
American Heart Association
Centers for Disease Control
National Institutes of Health
PAD Coalition
Reversegangrene.com
Endovascular Today