

Understanding PAD: The Must-Have Guide

How to identify and successfully treat **Peripheral Arterial Disease (PAD)**,
the silent killer affecting 1 and 5 baby boomers.



PALM VASCULAR CENTERS

Understanding PAD: The Must-Have Guide

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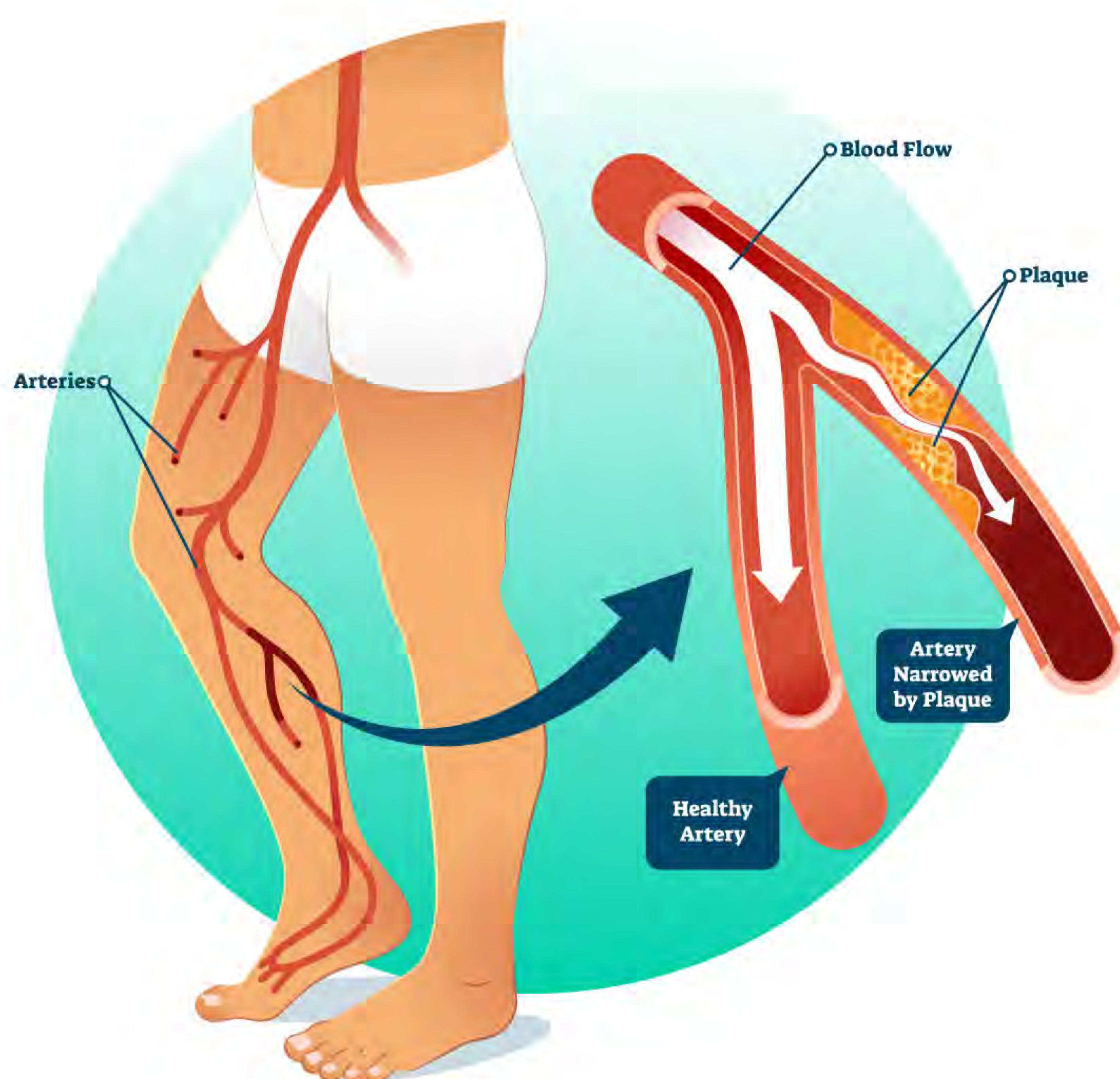
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1. What is Peripheral Arterial Disease (PAD)?

Peripheral arterial disease (also called peripheral vascular disease, PVD), is a disease in which blood flow to your limbs is limited due to narrowed or blocked arteries. Over time, your arteries tend to build up a fatty material that can block blood flow completely. As the lower extremities receive less oxygen, muscle groups and tissue below the blockages may suffer lower bloodstream oxygen. Because of this, you may experience pain or cramping—called claudication. Imagine holding your breath for two minutes, and then imagine that pain being in your leg or foot every time you take a few steps. Along with pain, however, reduced blood flow over time can lead to a myriad of further complications including wounds, limited ability to heal, gangrene, and ultimately limb loss.



✔ Important PAD & CLI Facts

-  Eight million Americans suffer from PAD
-  160,000+ amputations occur every year in in U.S. as a result of untreated PAD.
-  54% of those amputation patients never even received a diagnostic angiogram.
-  Angiograms reduce the odds of amputation by 90%

What is Peripheral Arterial Disease (PAD)?

Without proper and timely treatment, PAD can progress into its more aggressive form--critical limb ischemia, or CLI. Like PAD, CLI is caused by blockages in the arteries of the extremities; but these blockages are usually among multiple blood vessels at multiple levels throughout the legs. This often leads to a sensation known as 'rest pain', where the cramping, burning pain in your legs and feet may be especially pronounced--particularly when the foot is raised. The pain may be relieved when the raised foot is placed back down; this is due to gravity pulling what little blood it can back into the extremities. Situations like this prove to be a crucial point in the disease progression of PAD, given that CLI often leads to amputation when left untreated.

Unfortunately, despite the fact that conservative estimates place the number of Americans living with PAD between 8 - 12 million, the disease still goes under-treated. Over 150,000 amputations are performed every year due to PAD, and 48% of patients that receive an amputation die within the first year--a figure that increases significantly with each year following. Because of this, it is critical that we, as a nation, begin recognizing, diagnosing, and properly treating end-stage PAD.

2. The Symptoms of PAD

Many symptoms of PAD go unnoticed by both patients and physicians, commonly written off as consequences of older age. However, this is not the case; here are some of the most common symptoms of peripheral arterial disease:

- * Pain or tiredness in the calf, thigh, or buttock when walking that is relieved with rest (called intermittent claudication)
- * Toes or feet that become discolored when upright
- * Leg or foot pain that disturbs your sleep (rest pain)
- * Sores or wounds on toes or feet that heal slowly, or not at all
- * Burning feet (often diagnosed as neuropathy) that do not respond to medication
- * Toes or wounds on the lower legs that turn black (gangrene)
- * Changes in the skin on your leg (color, shiny, hair loss)

Experiencing any of the symptoms above?

Visit our website to try our free PAD symptom screener and find out if you could be at risk for PAD.

[Click here to take the PAD Symptom Screener](#)

3. Causes and Risk Factors

Like most diseases, it can be difficult to pinpoint a single cause for PAD. Instead, it is usually a combination of genetics, pre-existing illnesses, and lifestyle factors that give way to the buildup of plaque in arterial structures. The greatest risk factors are:

- * Smoking
- * Age (being over the age of 50 greatly increases the likelihood of the presence of atherosclerotic plaque in the arteries)
- * High cholesterol
- * High blood pressure
- * Stroke
- * Obesity
- * Diabetes
- * Chronic kidney disease / chronic renal failure
- * Coronary heart disease
- * Any family history of the above

Have some of the risk factors above?

Visit our website to try our free PAD symptom screener and find out if you could be at risk for PAD.

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4. Diagnosing and Testing for PAD

The diagnosis for PAD begins with an initial evaluation which involves a complete history and physical examination. Based on the findings, the vascular specialist would then proceed with any of several noninvasive studies: the most straightforward is an **arterial duplex** (also called an arterial ultrasound), which uses soundwaves to visualize the arteries. Arterial duplexes can typically diagnose 80-90% of abnormalities, but on occasion, the vascular specialist may request a **computed tomography angiogram (CTA)**, which uses x-rays to provide detailed imagery of the vasculature--or a magnetic resonance angiogram (MRA), which does the same but through a very strong magnetic field rather than x-rays. While all three of these techniques allow for the disease to be diagnosed and assessed, none allow for the administration of treatment. Because of this, the gold-standard of diagnosis is angiography; with angiography, the vascular specialist can determine whether or not disease is present and treat it on the spot.

5. PAD Treatments

PAD treatment begins with noninvasive measures. Depending on the progression of the disease, a combination of lifestyle changes and medications can help alleviate some of the associated pain--however, given that the disease will ultimately continue to progress, further treatment will eventually be needed.

The next stage of treatment would be through **angiography**. Typically, given that most patients with PAD aren't diagnosed until the disease is already quite prominent, this is where treatment often begins. Through angiography, the vascular specialist is able to see inside of the arteries and begin treating the 'stenosed' (narrowed) areas, using x-rays and a series of catheters and wires through a small nick in the groin, leg, or foot. Treatment is administered in several ways: In the presence of plaque, arteries can become stiff and inflexible--especially when the plaque is heavily calcified. **Atherectomy** devices provide treatment by removing this plaque, allowing for the arterial wall to regain its elasticity once more. This allows for more effective use of **angioplasty**. Angioplasty is the inflation of a small balloon in the stenosed area. The balloon expands and pushes the remaining plaque into the arterial wall--which permits a process called 'arterial remodeling', where the arterial wall compensates the plaque, leaving a larger diameter of vessel for blood to flow through. The balloon is deflated and removed within a matter of minutes.

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PAD Treatments (Cont.)

In most cases, this is enough to restore blood flow to the extremities; but the vascular specialist may determine that stent placement is necessary. A stent is a small, metal mesh tube that is placed within the arterial lining and becomes a permanent structure in the vasculature. It acts as a support for the artery, keeping the vessel open for increased blood flow.

Intravascular ultrasound (IVUS) is often used in conjunction with angiography as another form of visualization. With IVUS, the physician can see within the arteries themselves, which is helpful for ensuring location, placement, and selection of devices to use.

For most patients, treatment can end at angiography; a skilled PAD specialist can clear most blockages across multiple levels, and even in the smaller vessels towards the foot. However, in severe cases where a patient isn't able to get to a vascular specialist that focuses on PAD or CLI, they may have to resort to other forms of more invasive treatment.

While bypasses were once the primary form of treatment for vascular disease, today they are used in cases where endovascular reconstruction fails or cannot be performed. With a bypass, an artificial vascular graft or vein is used to literally bypass the blockage--attached to the artery upstream and downstream of the lesion, creating an alternative route for blood to flow. Bypasses are open surgeries and are performed by vascular surgeons.

PAD Treatments (Cont.)

While amputation is sometimes referred to as a 'treatment option', most PAD specialists would argue against this. Amputation can be prevented in over 90% of cases where a skilled vascular specialist intervenes. If you or a loved one have been told that amputation is your only option, please seek a second opinion from a PAD or CLI specialist.

6. PAD and Diabetes

Diabetes and PAD tend to come in pairs. Unfortunately, patients with the co-occurrence of diabetes, advanced age, or chronic kidney disease with PAD tend to have a heavily calcified form of atherosclerosis, which often involves the more distal (farther from the heart) portion of the vascular tree. This typically affects the smaller vessels in the lower legs and feet, making it even more critical that these patients see a PAD specialist. This form of PAD--and its more aggressive counterpart, critical limb ischemia (CLI)--more frequently lead to advanced symptoms like rest pain, ulceration, gangrene, and possibly limb loss.

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Understanding PAD: Meet Your PAD Specialist

Julio Sanguily III, MD

Dr. Julio Sanguily's journey in the treatment of **Critical Limb Ischemia (CLI)**—the advanced form of **Peripheral Arterial Disease (PAD)**—and amputation prevention began initially as a vascular surgeon performing open bypasses in a hospital setting. In keeping up with medical progression, this has migrated to predominantly using advanced techniques in endovascular revascularization, including using alternative access sites and the latest innovatory technology. This portion of the journey started in 2007 with a mere nine cases—and has now flourished into our present day high volume of patients, each being treated for this advanced form of deadly disease.

[Schedule an Appointment](#)

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