

## Varicose veins

Advancements in treatment

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**A**n estimated 30 percent of Americans will develop varicose veins at some point in their lives. The condition is often harmless, but may cause physical discomfort and symptoms such as leg fatigue or heaviness, aching pain and throbbing, burning sensations, leg swelling, night cramping, and “restless legs.” Some patients develop more severe side effects, including skin discoloration, bleeding, and leg ulcers. Past treatments involved surgical removal, or “stripping,” of the affected veins. New advances allow less invasive and safer treatments in the office setting.

### What are varicose veins?

Blood flows from your legs back to your heart through a system of deep and superficial veins. These veins are divided into segments, each with a one-way valve that opens as blood flows toward the heart, then closes to prevent leakage and backflow. The leg’s deep veins carry 80 to 90 percent of the blood returning to the heart, and their valves are less likely to fail than those in the superficial veins. If the superficial veins require treatment, blood flow will be diverted to the healthy deep system.

When the valves within your veins become damaged or weakened, the resulting backward flow creates increased pressure, or venous hypertension. Under this increased pressure, many veins—including those in the rectum, pelvis, and vagina—can expand and become “varicose,” a term that simply means enlarged. In most cases, varicose veins develop in your legs. Two of your leg’s superficial veins lie close to the skin and are the source of most visible varicose veins: the great saphenous vein, which runs on the inside of the thigh and lower leg, and the small saphenous vein, which runs behind the calf. Other sources include perforator veins, which connect the deep veins with the superficial veins.

Varicose veins are dilated and abnormal-looking, usually bluish in color, and frequently appear ropey or worm-like. By contrast, “spider veins,” also known as telangiectasias, are tiny red, blue, or purple blood vessels visible beneath the skin. Spider veins are frequently a mild cosmetic concern, but they can precede development of the more unsightly varicose veins.

In addition to varicose veins, venous hypertension can also lead to ankle swelling and aching, skin discoloration, and leg ulcerations. Other associated conditions include lipodermatosclerosis, in which

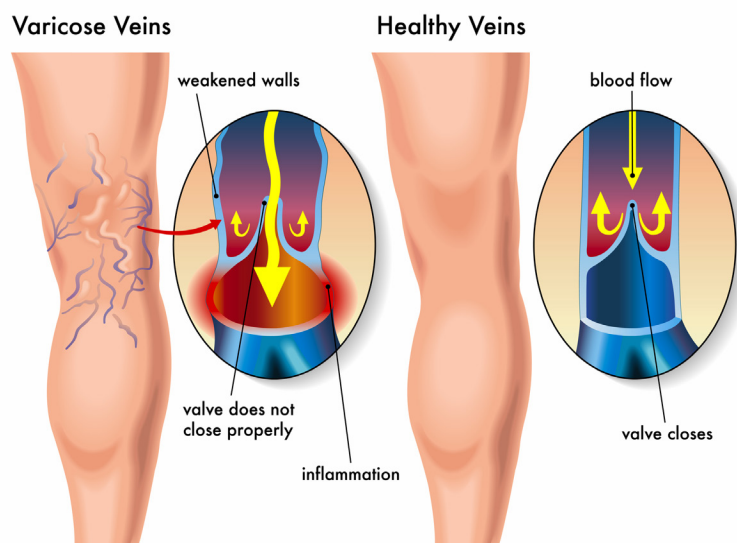
the fat under the skin just above the ankle becomes hard (sclerotic), resulting in an inverted “Coke bottle” look. About 10 percent of patients with venous hypertension also experience symptoms consistent with “restless legs” and nighttime cramping. These conditions are referred to as chronic venous insufficiency, and the valves are referred to as incompetent.

Venous insufficiency or valve incompetence is usually related to genetics, and often runs in families. Women are affected more than men. Age, multiple pregnancies, blood clots in the veins, and occupations that require long periods of standing may all exacerbate vein wall and valve problems.

## Diagnosis

Your physician may start with a visual examination, checking for swollen ankles, achy legs, persistent itching, and leg fatigue or heaviness, particularly after prolonged standing. In more advanced cases, visual signs may include leg ulcers, skin deformities, and discoloration of the skin. Inflammation and clots may develop in the surface varicose veins, resulting in pain, tenderness, and redness, a condition known as superficial phlebitis or thrombophlebitis.

Diagnosing problems in the saphenous or deeper veins requires ultrasound evaluation. Before any treatment recommendations are



made, varicose vein patients with leg swelling, skin changes, or other symptoms should undergo an ultrasound to determine which veins are affected. In some cases, a vascular specialist may order

additional testing, such as a CT-venogram or an MR-venogram, to further assess the deep venous system.

## Treatments

Conservative measures include regular exercise, intermittent leg elevation, and weight loss. If worn properly, compression stockings may relieve symptoms, although they are not a cure.

More aggressive corrective treatment focuses on eliminating the leaky valves. Surgical stripping accomplishes this, but the

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procedure has been associated with complications such as hematoma (clotted blood within the tissues), nerve damage, and recurrent varicosities, and is no longer commonly performed in the United States.

Instead of surgically removing them, modern therapies close off (ablate) varicose veins, addressing the underlying cause without creating disfigurement. These minimally invasive ablation treatments are performed in the office, do not require hospitalization, and, in some cases, do not require local anesthesia around the target vein. Patients generally resume normal activities within days, and experience symptom relief within weeks.

Endovenous catheters—thin tubes guided through the veins to problem areas identified by ultrasound—allow physicians to seal off the saphenous veins using thermal or non-thermal means:

### Thermal endovenous ablation.

A catheter capable of generating heat—in the form of radio frequencies (RFA) or laser energy (EVLA)—is inserted into the saphenous vein or its tributaries. With local anesthesia applied around the target vein, the tip of the catheter is heated up and pulled back at a constant rate. Heat energy ablates the vein and prevents reverse blood flow.

Advantages over traditional surgery include reduced pain, shorter convalescence, and fewer complications such as nerve damage, hematoma, wound infections, and deep vein thrombosis (DVT). Minimal adverse events include failure to close the vein, transient numbness and tingling, and a mild “pulling” sensation in the thigh.

### **Non-thermal endovenous ablation.**

These procedures seal off the saphenous vein without the need for local anesthesia or heat energy. The elimination of heat results in less short-term pain and fewer adverse effects to the surrounding soft tissue and nerves. Physicians close off the veins using chemical sclerosants, which create inflammation; intentional scarring of the vein wall; medical adhesives; or a combination of approaches.

Your physician may recommend one of these options:

Ultrasound-guided foam sclerotherapy injects a chemical sclerosant into deeper leaky veins. While larger veins can be treated with this procedure, there may be higher failure rates, a slightly higher rate of inflammation, and a temporary darkening of the skin (hyperpigmentation).

Polidocanol endovenous microfoam treatments employ Varithena, a patented drug delivery device, to inject sclerosants into the saphenous veins and varicosities, thereby closing them off.

ClariVein utilizes both a liquid sclerosant and a rotating wire to damage and close off the vein, with local anesthesia applied at the insertion site. The effectiveness of this Mechanochemical

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Endovenous Ablation (MOCA) is comparable to thermal endovenous ablation techniques.

The VenaSeal Closure System uses a custom device to deliver a specially formulated medical tissue adhesive to the target saphenous vein, producing fibrosis (a form of scarring). Discomfort throughout the procedure is minimal.

Additional treatments include sclerotherapy, an injection procedure commonly used to treat spider veins or smaller tributary veins, and ambulatory phlebectomy (AP), the removal of surface varicose veins under local anesthesia through very small incisions using specialized hooks. These may be performed as a single procedure or in conjunction with an endovenous ablation.


Combining these technologies with accurate ultrasound imaging ensures a more complete treatment plan and a better outcome.

### **Vein specialists**

Your primary care provider can recommend a vein specialist proficient with all available tools. This might include physicians with backgrounds in general or vascular surgery, interventional radiology, anesthesiology, and internal medicine. You might inquire whether they are board-certified by the American Board of Venous & Lymphatic Medicine (ABVLM.org). You'll find additional information from the American College of Phlebology (phlebology.org) and the American Venous Forum (veinforum.org).

If you have ultrasound documentation of valve incompetence, most health insurance carriers will cover part or all of the cost for varicose vein treatment. Check your policy regarding vein treatments that are covered, what your potential share of the cost might be, and whether your health care professional needs prior authorization to perform the procedure.

### **Summary**

Varicose veins are vessels expanded by pressure produced by damaged or weakened valves. Most frequently appearing in the legs, varicose veins are usually harmless, but may cause physical discomfort and other symptoms. Unlike prior treatments that required surgery, modern procedures can be performed in the office setting and do not produce permanent disfigurement. 

**Primepares G. Pal, MD, FACP, RPVI, and Jacqueline S. Pal, CNP, RPhS,** are the founders and owners of Minnesota Vein Center, P.A., one the first dedicated vein clinics in the Twin Cities area. The center is located in North Oaks, MN.