

# Article 1

## Understanding Venous Insufficiency

### *What is venous insufficiency?*

Veins are an important part of our circulatory system. When working properly, they return oxygen-depleted blood back to the heart and lungs where it is once again “filled” with oxygen and sent out through the arteries for delivery to tissues. Most veins, particularly the ones in the legs, rely on the proper function of one-way valves to accomplish the above task (see figure 1). These valves, along with the muscle contraction, allow blood to move “uphill,” against gravity. As a result, the pressure and volume of blood within leg veins is kept very low. Problems arise when part of this “vein pump” is broken (see movie ). This condition is known as venous insufficiency. The most common cause is failure of the special one-way valves. Without an adequately functioning vein pump, gravity causes blood to pool in the leg veins. This leads to abnormally high venous pressure and causes enlargement of veins close to the skin. These enlarged veins are the spider veins and ropey varicosities which are so cosmetically displeasing (figures 2 and 3).

Figure 1

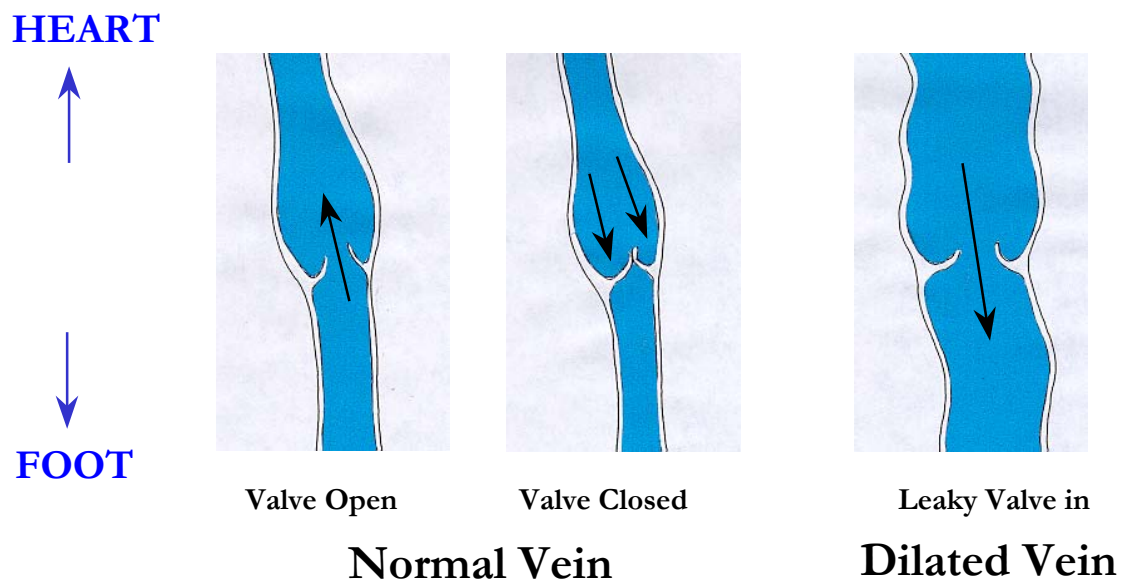




Figure 2.  
Spider Veins



Figure 3.  
Varicose veins

### *Why does this happen?*

There are a number of reasons why veins lose their ability to effectively transport blood back to the heart, a condition known as venous insufficiency. Hormone fluctuations in women, particularly around the time of pregnancy are thought to play a significant role in the development of venous insufficiency. Physical damage to the special valves is another important cause. Blood clot formation within the veins and around the valves (deep venous thrombosis or thrombophlebitis) is an important cause of reflux. Traumatic injury from an accident or surgery is also potential causes. Environmental factors play an important role. Occupations which involve a great deal of standing, such as nursing or manufacturing positions, are associated with the development of venous insufficiency. Venous insufficiency runs in families. Most people with varicose veins can name a first or second degree relative with a similar problem. There are many reasons why veins fail. In most cases, however, there is not one clear cause for the condition. Rather, most patients have a mix of genetic, physiologic and environmental risk factors.

### *What are the symptoms of venous insufficiency?*

Venous insufficiency causes a number of symptoms. The most common include tired, achy legs, particularly at the end of the day. Others include burning, stinging sensations, usually localized to specific areas in the leg. Leg cramps and “restless legs” at night are often described. Swelling around the feet and ankles is common. Contrary to popular belief, spider veins and ropey varicose veins by themselves do not cause symptoms. Symptoms arise from abnormally high pressure within the veins due to malfunction of the vein pump described above. These high pressures force fluid and toxic byproducts of metabolism, which are normally transported away from the legs for elimination by the kidney and liver, into the soft tissues of the legs. This is thought to irritate nerve endings near the abnormal veins which cause the above symptoms.

*What are the long-term consequences of untreated venous insufficiency?*

If left unchecked, venous insufficiency can lead to a number of distressing signs and symptoms. The earliest signs are progressive swelling in the feet and ankles along with brownish discoloration of the skin around the ankles and calves (see figure 4). As time goes on the skin becomes chronically inflamed, often weeping fluid and scaling (see figure 5). Episodes of bacterial infection can occur, often requiring hospitalization and IV antibiotics. Ulcers of the skin are common at this stage (see figure 6). Finally, the skin becomes irreversibly thickened and leathery.

The above distressing problems do not occur in everyone. For some, things never progress beyond troubling symptoms such as pain, swelling and cosmetically displeasing enlarged veins. Nevertheless, there is a potential for serious disabling problems from this condition.



Figure 4.  
Brown pigment skin changes

Figure 5.  
Dermatitis and scaling



Figure 6.  
Venous ulceration



### *What is the treatment?*

The first step in treating venous insufficiency is making the correct diagnosis. This involves a consultation with a vein specialist including a complete history and physical examination. Noninvasive testing with duplex ultrasonography is usually the next step. Combining the information from the history and physical and ultrasound examination, the physician is able to determine which veins are working normally and which ones are not. This allows the creation of a treatment plan which is tailored to each patient. The first priority is to address any superficial veins with significant valvular reflux. This may simply require wearing graded compression hose if a patient is only worried about symptom relief. Sometimes, hose are not an option or are not enough. In this case, there are a number of minimally invasive and surgical treatments available. [CLICK ON "COMPREHENSIVE" VEIN CARE FOR AN EXPLANATION OF AVAILABLE TREATMENTS.](#)

### *Summary*

Venous insufficiency and varicose veins are a common problem. The first step in treatment is obtaining a correct diagnosis. Thereafter, venous reflux, if present should be treated. Finally, several techniques are available to eliminate cosmetically displeasing veins which remain