



Venous Disease

Circulating the Facts About Peripheral Vascular Disease

*Brought to you by the Education Committee
of the Society for Vascular Nursing*

www.svnnet.org

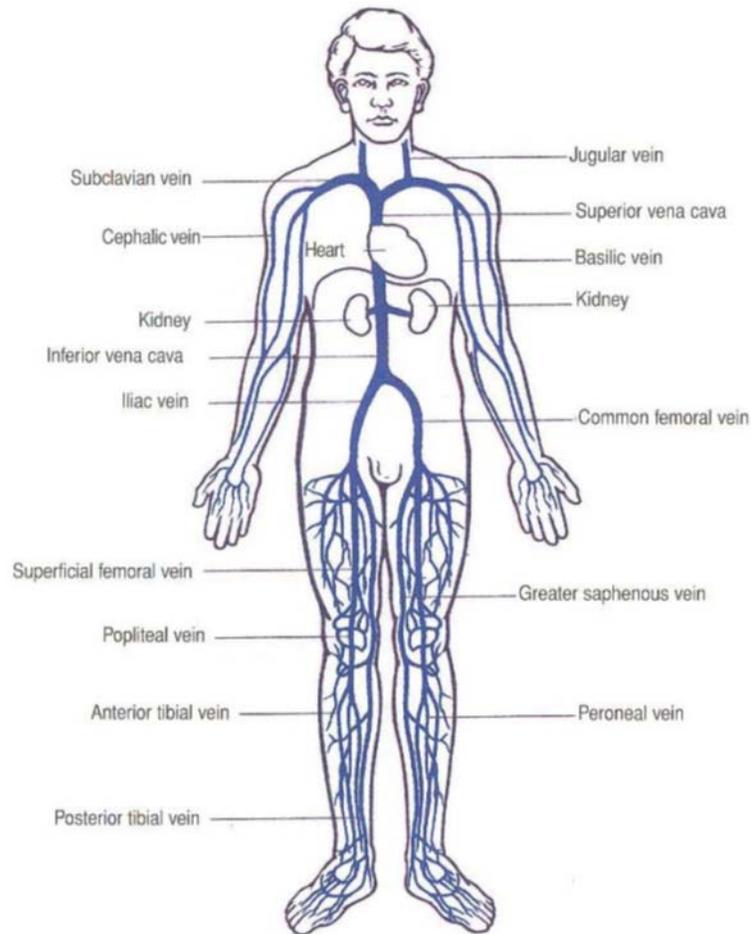
Venous Disease

This booklet will give you and your family facts about venous disease.

This booklet tells you about:

- Venous circulation
- Venous problems
- Risk factors for developing venous problems
- Tests you may need to have
- Treatment and surgery for venous problems

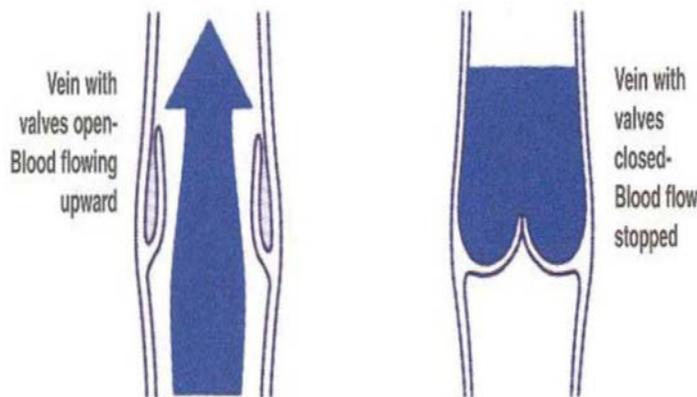
Boldface type is used to identify words that may not be well known to you. These words are defined on the last page of this booklet.



The Circulatory System

The **circulatory** system consists of blood vessels called **arteries** and **veins**. The heart pumps oxygen-rich blood through the arteries to all body tissues. This provides body cells with the food and oxygen needed. Veins carry blood from the body cells back to the lungs and heart. Veins that are close to the surface of the skin are called **superficial veins**. Veins that are in the muscles are called **deep veins**. Blood flows toward the heart from the superficial to the deep veins.

Blood flows faster and has more force in the arteries. This creates the pressure that helps to keep the walls of the arteries strong. The veins have less pressure and the vein walls are not as strong. The inner walls of veins contain **valves** which open as blood flows toward the heart. The valves close to stop blood from flowing backward. The muscles of the legs squeeze the vein to help **venous** blood move towards the heart. This squeeze occurs with movement of the feet.



Two types of problems can occur with the veins in your body:

- Weakness of the vein wall
- Valves in the veins do not work very well or stop working.

The problem is caused when blood collects or pools in the vein. Pooling of blood is called venous **stasis**. This results in swelling of the vein and clotting of blood.

By asking questions and examining your legs, your healthcare provider can tell if you are having problems with your veins. You may be examined in the sitting, lying, and standing positions. You may also need to have special tests. The tests ordered may be **non-invasive** and/or **invasive**.

What are the Diagnostic Tests for Venous Disease?

Non-Invasive Testing

There are no needles, x-ray or dyes used in **non-invasive** tests. These tests are painless, with little risk and side effects. You do not need to do anything before the non-invasive test. The tests do not always take place in the hospital, sometimes it can be done in the doctor's office. You are able to go home once the test is finished.

Types of Non –Invasive Tests

Venous Doppler Ultrasound

Doppler **ultrasound** is a noninvasive test that is used to measure your blood flow and blood pressure in your veins. Sound waves are reflected from the moving red blood cells and are recorded. A probe is placed on different spots over the veins on your legs. This helps the technician listen to the blood flow. During the test you will be asked to hold your breath, and then breathe out quickly. This test is used to tell if you have blood clots or weak valves in the legs.

Impedance Plethysmography or IPG

IPG is used to measure blood flow in the major veins of the legs. You will need to be in a lying position for this test. A blood pressure cuff is placed on your thigh. Plastic strips that are connected to a special machine are placed on your calf. The machine records blood flow in your veins. The thigh cuff may be pumped up during the test. This test is used to tell if you have blood clots.

Duplex Imaging

Duplex ultrasound uses sound waves to create a picture of your veins. During the test you may be asked to stand, lie on your back, and on your stomach. A cool gel is placed on your legs. A probe that creates the image of the vein is then placed over the veins. This test may be used to tell if you have problems with your veins such as blood clots and weak valves.

Invasive Testing

The use of needles, contrast and/or X-ray is needed for invasive testing. Your healthcare team will tell you of risks and side effects that these tests may cause. You will be told what you may need to do before the test. You may need to sign a consent form.

Types of Invasive Tests

Venogram

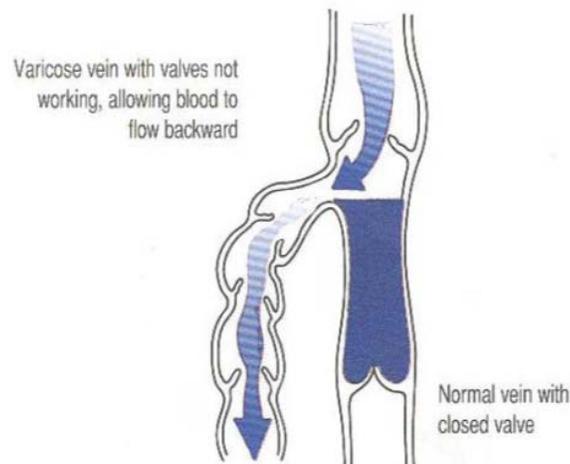
A **venogram** is an **invasive** test that uses contrast to highlight your veins and x-ray to take pictures of your veins. This test may be done during your hospital stay or as a same day procedure. You will be awake during the test. You may be given medication to help you relax. The contrast is injected through an intravenous (IV) line that is placed into a vein in your hand or arm. The contrast may cause a hot, burning-like feeling that may last a

short time. This test is used to tell if you have blood clots and creates a picture of your venous system.

Venous pressure measurements are done if there are problems with blood flow in your veins. If blood is not able to flow back to your lungs, you are said to have **venous insufficiency**. During the test a small needle is placed in a vein on your foot. The needle is attached to a special machine called a transducer. The transducer is used to measure the pressure in your vein. You will be asked to lie down, sit up, and pump your foot. These actions are used to check how well the valves in your veins are working. Your healthcare team will use the test results to help determine what can be done to treat your problem.

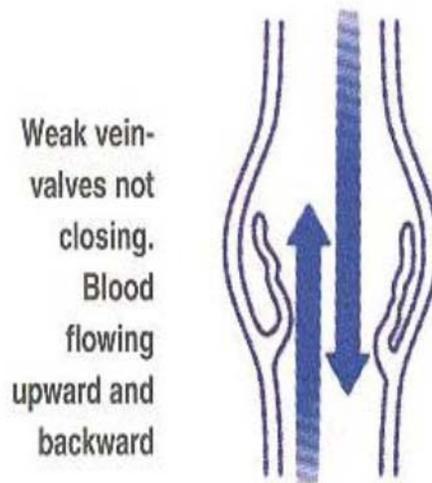
What Are Varicose Veins?

Varicose veins are located close to the surface of the skin, superficial veins. These veins look raised and not very straight. They are most often seen on the legs, but can be seen on other parts of the body.



What Are the Causes?

Varicose veins may occur when weak vein valves allow blood to collect in the veins. When the blood collects in the vein, it causes the veins in the lower legs to stretch (like a balloon as it is blown up), The vein then becomes thinner and may twist. Blood may move from the veins into the tissues. When this happens, the leg becomes swollen.



Who will develop varicose veins?

Risk factors that may lead to varicose veins include:

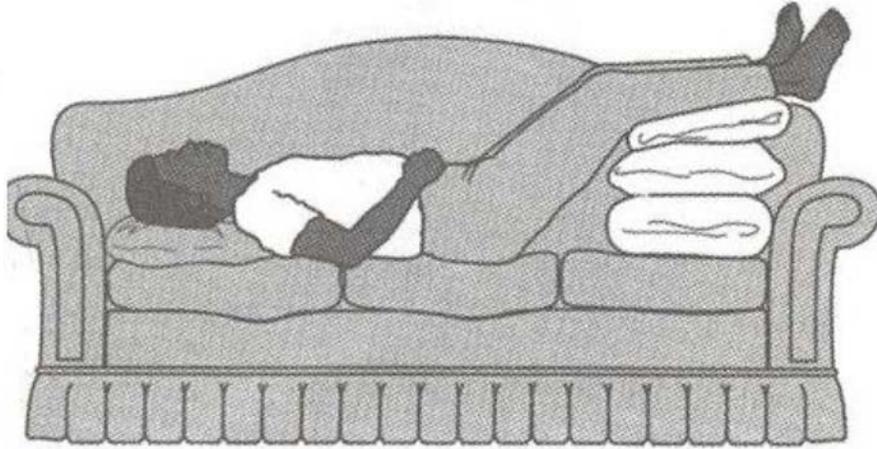
- Increased Age
- More than one pregnancy
- Heavy Lifting

Signs and Symptoms of Varicose Veins

- Purple, bulging, or uneven looking surface veins on the legs
- A dull, heavy ache in the legs after standing for a long time
- Leg swelling
- Itching, burning, and cramping of the legs

To relieve symptoms and prevent the condition from getting worse:

1. Do not stand for long time
2. Bend your feet when standing
3. Stand on your tiptoes a few times
4. Raise your legs above the level of your heart for 1/2 hour, three times a day
5. As directed by your doctor, wear pressure support stockings
6. Do not cross your legs
7. Control weight gain



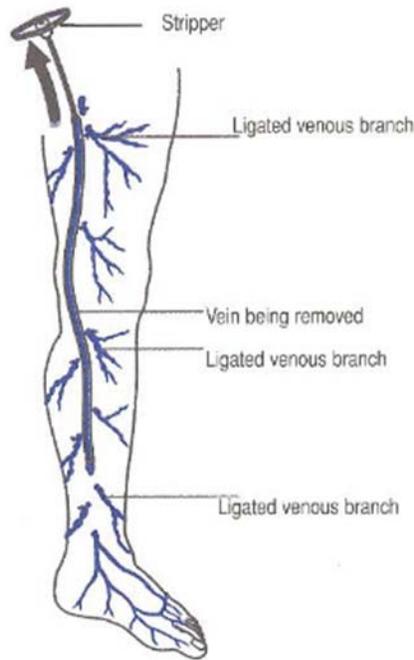
Treatment of Varicose Veins

Talk to your healthcare provider about treatment of your varicose veins.

Sclerotherapy can be done in your healthcare provider's office. The healthcare provider injects a solution into the affected vein. The solution causes the vein to collapse. Blood is then redirected through the vein. After the injection, the leg is wrapped with an elastic bandage. You may need to wear support stockings. The stockings keep pressure on the treated vein. When the bandages are removed, the bulging of the veins should improve. Depending on the number and types of vein, you may need more than one treatment. Over time, the collapsed vein fades.

Endovenous Ablation –The healthcare provider places a catheter (a thin tube), into the enlarged vein. Heat is applied to the vein through the tip of the catheter. Radiofrequency or laser energy may be used. When the catheter is taken out of the vein, the vein collapses. Blood is redirected through healthier veins. Pressure bandages or support stockings are placed on the leg after the procedure.

Ligation, stripping, and phlebectomy are types of surgery to treat varicose veins. During **ligation**, the varicose veins are “tied off.” **Stripping** occurs when the varicose vein is removed. **Phlebectomy** is the taking out of selected veins through small incisions along the leg.



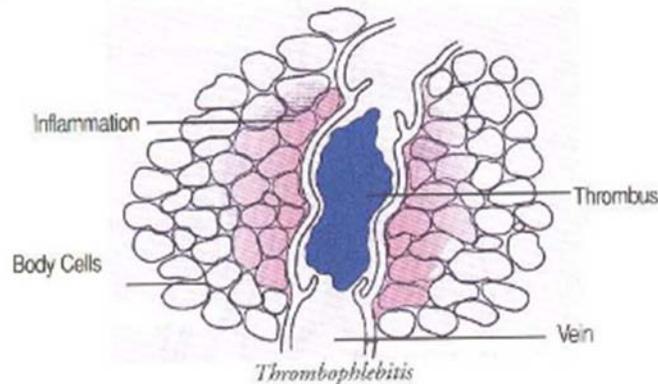
Vein Ligation and Stripping

What is Thrombosis and Thrombophlebitis?

Thrombosis is caused by a **thrombus** (blood clot) sticking to the wall of the vein. The clot irritates the vein wall causing redness, swelling and pain.

There are two types of **thrombophlebitis**:

- superficial because it occurs in veins close to the skin surface
- **deep vein thrombosis (DVT)** in veins deep in the muscles



These conditions occur in a leg vein but can also occur in the arm or other areas of the body.

Superficial Venous Thrombophlebitis

What Are the Causes?

Superficial thrombophlebitis can be caused by irritants to the lining of the vein. Some causes may be:

- Injury to the affected part of the body
- Infection
- Prolonged use of intravenous (IV) medications
- An inherited (family) condition that increases the risk of blood clotting
- Hormone replacement therapy
- Smoking
- Traveling and sitting for a long time
- Cancer
- Inflammations

Signs and Symptoms of Superficial Thrombophlebitis:

- A hard, cord like feeling of the vein
- Tenderness or pain
- Redness or a feeling of warmth
- Possible swelling of the affected arm or leg

Treatment of Superficial Thrombophlebitis

- Your doctor may suggest soaking the area in warm water
- Raising the affected arm or leg
- Support stockings or elastic bandage
- Anti-inflammatory medicine
- Medicine for pain as needed

Superficial **Thrombophlebitis** can improve quickly and without any problems.

Deep Venous Thrombosis (DVT)

DVT occurs when a deep vein is blocked by a blood clot or **thrombus**. Treatment can prevent clots from getting bigger or moving into the blood stream. If the clot moves into the bloodstream it may travel to different parts of the body for example to the lungs.

What Are the Causes of DVT?

DVT can be caused by slow or sluggish blood flow in the deep veins. It may also be caused by conditions that cause the blood to clot more easily.

Below are examples of risk factors for DVT:

- Smoking
- Long periods of bed rest or sitting
- Decreased activity for a long period of time
- Major surgery, prolonged illness
- Injury to the veins
- Over weight
- Pregnancy
- Injury to an arm or leg
- Cancer and its treatment
- Use of birth control pill or hormone replacement therapy
- Previous DVT or pulmonary embolism (PE)
- Family history of DVT or PE
- An inherited (family) condition that increases the risk of blood clots

Signs and Symptoms of DVT

- Swelling of an arm or leg
- Pain, cramping, or an aching feeling in one leg or arm
- Increased skin temperature over a part of the arm or leg
- Changes in skin color (red, blue or very pale)

Sometimes there are no symptoms.

Treatment of DVT

You will be treated with blood thinners. The blood thinner can be given in the hospital or while you are home.

You must take the blood thinner as ordered by your healthcare provider.

- Blood tests may be needed to guide your treatment
- You may have to take blood thinners for several months
- Pain medicine may be given if you are having pain
- Be active

An elastic bandage may be used to wrap the involved arm or leg. You may be fitted for or given a prescription for support stocking or sleeve. This stocking/sleeve should be worn daily for several months. Do not wear stockings while bathing or sleeping. Your doctor will tell you when it is safe to stop wearing the stocking/sleeve.

Thrombolysis is an invasive treatment for DVT. Medicine that helps to break up the clots is used. A **catheter** is used to deliver the medicine. The catheter is put into the vein and moved to the area of the clot. The clot usually dissolves in a few hours to a few days. Your healthcare provider may use venogram or Ultrasound to check if the treatment is working.

Angioplasty or widening of a vein may be needed after the clot dissolves. A catheter and balloon is used to widen the vein. Sometimes a **stent** may be needed to keep the vein open.

The swelling or discomfort in the vein may go away within a week of the DVT. It may take about six (6) months before you feel better. You must follow your healthcare provider's instructions and take your medications as directed.

DVT can recur and cause problems of swelling and leg pain.

If a DVT is not treated it may cause a **Pulmonary Embolism (PE)**. A PE is a blood clot that travels from a vein and moves into your lungs. If you have a PE, you may have trouble breathing. You may need medicine to break up the clot or surgery to remove the clot. Another treatment is the use of a **filter**. The filter stops the clot from going to the lungs. The filter is placed in a blood vessel called the vena **cava**.

PREVENTION:

If you have a DVT your healthcare provider will suggest you wear your stockings and take your medicine.

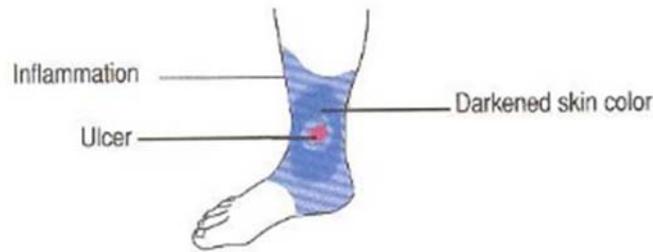
If you have risk factors for a DVT you should:

- Exercise your lower leg muscles when sitting for long periods
- Stand and walk at least every 30 minutes on long flights
- When traveling in a car stop often and walk around
- Get out of bed and move around soon after surgery or being ill
- Follow up with your healthcare provider as directed

Venous Ulcers

Venous stasis ulcers can occur because of prolonged swelling of the lower calf or ankle. The swelling causes the leg tissues to stretch and weaken.

This condition is called **chronic venous insufficiency**. The skin may become brown in color and feel hard. If the skin breaks, a **venous ulcer** will form.



Chronic Venous Insufficiency and Venous Ulcer

Signs and Symptoms of Venous Ulcers:

- Bluish and/or brownish color of skin on lower legs
- Swelling and a feeling of heaviness in the legs
- Open sores with clear or blood-tinged drainage
- A burning or aching feeling at the ulcer sites

You Can Help To Prevent Venous Ulcers:

- Raise your legs above the level of the heart for 30-60 minutes three times daily
- Raise the foot of your bed 4-6 inches on blocks or books
- No pillows under your knees
- Wear elastic bandages, fitted support stockings, or use a compression pump, as prescribed
- DO NOT sit or stand for periods of more than 15-20 minutes without walking or flexing your calf muscles
- Prevent injury to your legs
- Do not cross your legs
- Do not wear tight clothing
- Reduce sodium (salt) intake

Warning Signs

Tell your healthcare provider if you have any of the following:

- Increased swelling of the feet, ankles, or legs
- New or larger ulcers of the legs
- Increased pain in the legs
- New discoloration of the legs
- Bad smelling drainage from the leg ulcers
- Legs feel very warm
- Bleeding
- Increase body temperature

Treatment of Venous Ulcers

- Follow your healthcare provider's guide for ulcer care
- When in bed, raise your legs higher than the level of the heart to decrease swelling
- Raise legs when able during the day
- A compression pump may be used for severe swelling
- Elastic bandages or support stockings will help control swelling
- Your physician may order antibiotics if your ulcer becomes infected
- Good eating habits include proteins, carbohydrates, vitamins and minerals
- Drink 6-8 glasses of liquid (water) daily if able

***Other Treatment***

You may be asked to see a wound care specialist

In Conclusion:

Venous disease can cause sudden and serious problems. Your healthcare provider will discuss the tests and treatments you may need. Follow your treatment plan to prevent serious problems.

For a Better Understanding

Ablation: Using laser or radiofrequency to close a vein. A catheter is used to deliver the laser or radiofrequency energy.

Angioplasty: a nonsurgical treatment for DVT that is used to widen the vein after the blood clot has been dissolved.

Artery: A blood vessel carrying oxygen-rich blood from the heart to the rest of the body.

Catheter: A flexible tube placed in a blood vessel to inject contrast or medication.

Chronic Venous Insufficiency: A chronic condition of poor venous blood flow, swelling, and weakening of the skin tissue.

Circulatory: The movement of blood as it travels in the body

Deep Venous Thrombosis (DVT): A condition in which a deep vein(s) is partially or totally blocked by a clot

Duplex Imaging: A non-invasive procedure that analyzes blood flow and produces a image of the blood vessel.

Filter: Device sometimes placed into the vena cava to stop blood clots from traveling from the legs to the lungs.

Invasive: Tests which use injection, dye, and/or x-rays to diagnose disease.

Ligation: A surgical procedure during which the varicose vein(s) is tied off.

Phlebectomy: Removal of selected veins through small incisions.

Pulmonary Embolism: A blood clot that moves from a vein and travels to the lung.

Non-invasive: Tests which do not involve needles, contrast, or x-ray to diagnose disease.

Sclerotherapy: Injection of a chemical into a varicose vein to stop flow of blood in that vessel.

Stent: A wire mesh tube that is expanded at the site of stenosis in order to relieve the stenosis and hold the artery in its expanded state.

Stripping: A surgical procedure in which the varicose vein is removed.

Superficial: A vein close to the surface of the skin.

Thrombus: A blood clot.

Thrombophlebitis: Inflammation caused by a blood clot clinging to the vein wall.

Ulcer: A sore or break-down of the skin surface and/or deeper tissue.

Ultrasound: A non-invasive procedure that uses high frequency sound waves to create a graphic image of vascular structures (veins, arteries, and valves) and shows flow of blood.

Valves: Cup-like structures within the inner wall of a vein which prevent backward flow of blood.

Varicose Veins: Veins close to the surface of the leg that have stretched and are bulging and uneven in appearance.

Veins: Blood vessels that carry the blood from the body back to the heart.

Vena Cava: Large vein in abdomen carries blood from legs and abdomen back to heart.

Venous: Relating to the vein or blood flow in the vein.

Venogram: X-ray picture of the veins obtained by the injection of dye into the venous system.

Venous Pressure Measurements: An invasive procedure which measures venous pressure and function of the venous valves.

Venous Stasis Ulcer: An open sore caused by severe or long term swelling of the leg, which weakens the skin tissue.

For More Information:

Vascular Disease Foundation <http://vasculardisease.org/>