

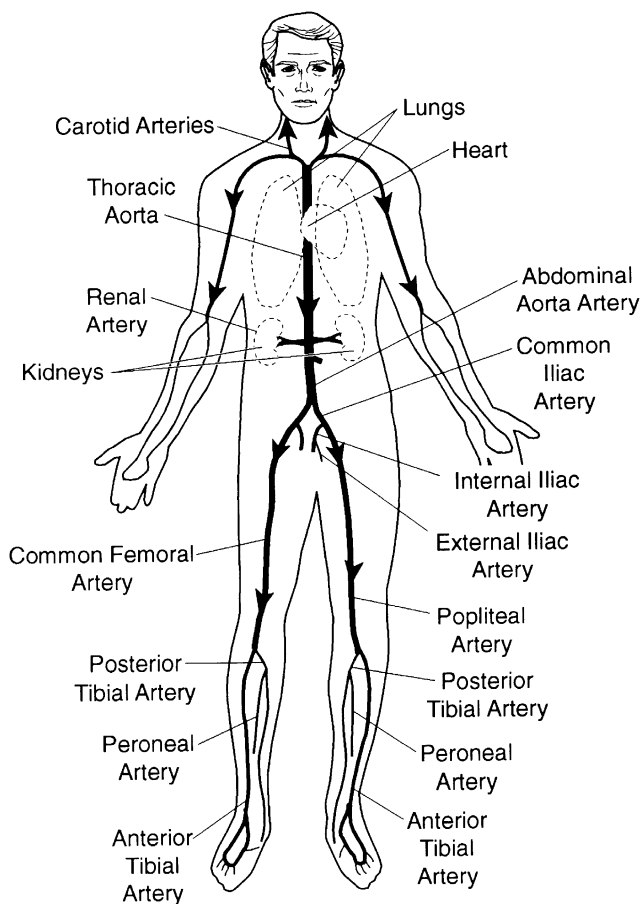
# Understanding Vascular Disease

## What is normal blood flow?

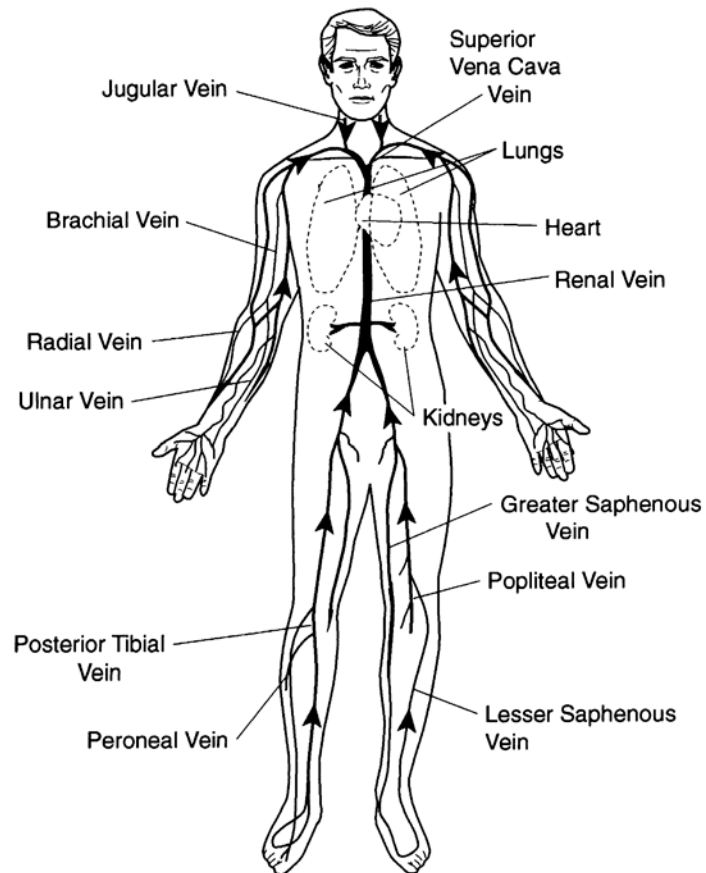
Your body has two types of blood vessels:

- **Arteries:** Carry blood with oxygen and nutrients from the heart and lungs to all other areas of the body.
- **Veins:** Return the blood that has waste products from all parts of the body back to the heart and lungs.

Normal blood flow occurs when the arteries and veins do their job of transporting blood to and from areas of the body without interruption. Normal blood flow also occurs when arteries and veins are fully open and have a smooth lining, making it easy for blood to flow through them.



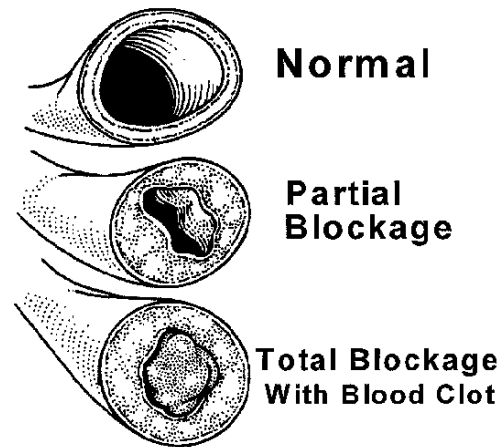
**Arterial System**



**Venous System**

## How does atherosclerosis affect normal blood flow?

Atherosclerosis is sometimes called “hardening of the arteries.” Atherosclerosis is due to changes in the inside lining of artery walls where fatty materials with cholesterol and calcium are deposited on the sides of the artery. This results in a narrowing of the blood vessel. When the blood vessel narrows, it is harder for blood to flow through the vessel and deliver oxygen rich nutrients to the muscle. This narrowing of the blood vessels can occur in your heart, brain, and / or vascular system (neck, abdomen, arms, legs).

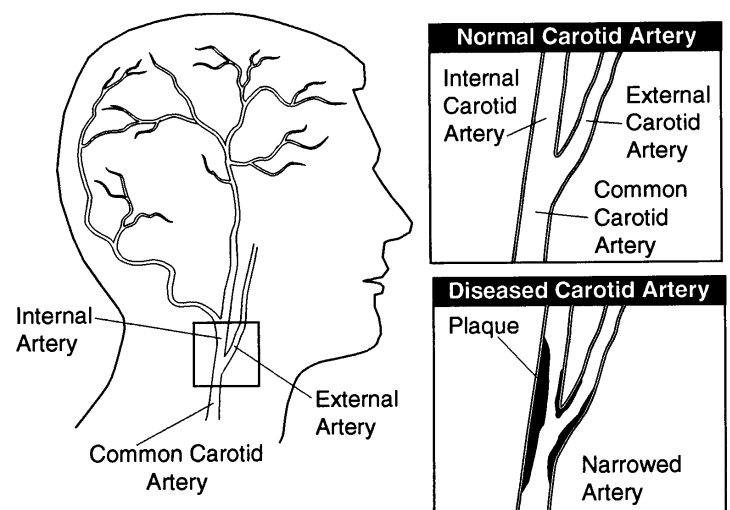


## What is vascular disease?

Vascular disease is a progressive condition that mainly affects people over 45 years of age. It is the leading cause of amputations. There may be changes in both arteries and veins with vascular disease. The disease is the same process that occurs in the coronary arteries of the heart except the arteries of the rest of the body are affected. Deposits of cholesterol plaque can block arteries such as the carotid, abdominal aortic, iliac, femoral, or popliteal arteries. These blockages cut down the artery’s ability to deliver the proper amounts of oxygen-rich blood to the muscles of the surrounding area.

- **Vascular Disease in the Brain**

When the brain does not get enough oxygen due to a decrease in blood flow through the carotid arteries, it cannot function properly. A temporary decrease in blood flow is called TIA. A permanent loss of blood supply to a portion of the brain results in a stroke or CVA. TIAs or stroke can result from blockage in a carotid artery. TIAs are considered a warning sign of a future CVA.



**One or many of the following symptoms may appear:**

- Dizziness / Fainting
  - Temporary loss of vision, like a window shade closing over the eye.
  - Numbness and loss of strength in an arm or leg or muscles of the face, especially on one side of the body
  - Difficulty speaking
  - Difficulty understanding simple statements
  - Headache
  - Loss of Coordination
- **Vascular Disease in the Lower Abdomen and Legs**

A decrease in blood flow to the arteries in the lower abdomen and legs produce symptoms in large muscles such as muscular pain, aches, or cramps. These symptoms taken together are known as **intermittent claudication**. It is produced when leg muscles do not get enough oxygen during weight-bearing exercises such as walking or climbing stairs. This is called “ischemia,” which simply means, “lack of oxygen.” The symptoms usually disappear within 1-5 minutes after the walking has stopped and occur again when walking resumes.

When the femoral and popliteal arteries are blocked, the areas that are affected are the calf and foot. Blockage in the upper part of the iliac arteries may cause claudication in the buttocks region, hips, thighs and calf muscles. Claudication always occurs in the muscles, not the joints or bones.

**Classification system for claudication (leg pain scale)**

A classification system is often used to help determine the severity of claudication symptoms at rest and with weight-bearing exercise. It is used primarily during exercise sessions as a tool to guide how much exercise you should do. When you are walking, continue until your symptoms reach Grade 3 or 4. Stop as soon as you reach Grade 4, rest for a few minutes until your symptoms go away and then begin walking again.

- Grade 1** = Onset / Minimal leg discomfort
- Grade 2** = Moderate leg discomfort
- Grade 3** = Intense / Severe leg discomfort
- Grade 4** = Excruciating / Maximal leg discomfort

**Claudication**

## Other symptoms of vascular disease

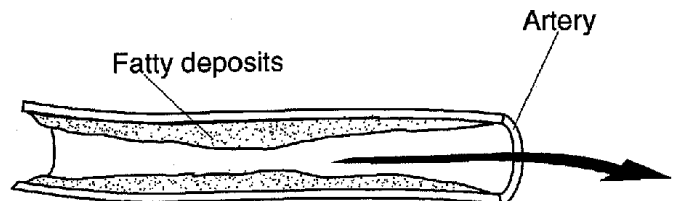
Other symptoms that can occur with poor circulation to the arms and legs:

- Cool, pale skin, cold hands and feet
- Reddish-blue color of the skin and under the nails of fingers and toes, especially when the legs are down or lower than heart level.
- Sores that take a long time to heal, scabbed over, look black
- Loss of hair on legs, feet, toes
- Faint or no pulse in the legs and / or feet

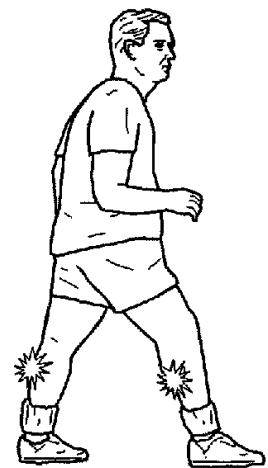
## Stages of vascular disease

The four stages of vascular disease in the legs:

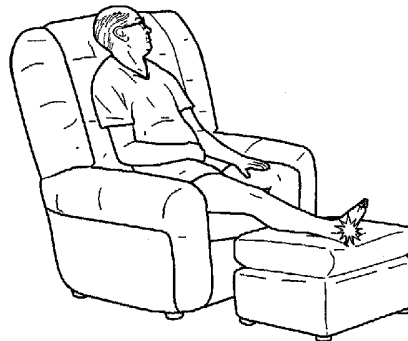
1. Atherosclerosis has begun in the arteries, but no symptoms have yet appeared



2. Claudication symptoms appear in the legs with weight-bearing activity, but are relieved with resting. Exercise is the best treatment during this stage to improve circulation, decrease claudication symptoms and avoid surgery.



3. Pain, aching and cramping occurs all the time, not just with weight-bearing activity. This stage suggests advanced arterial disease. Surgery is usually needed to restore blood flow to the affected part of the leg.



4. Prolonged lack of blood flow results in death of some muscle tissue (gangrene). This is the most advanced stage of arterial disease, which can result in amputation.



## **Who gets vascular disease?**

Vascular disease primarily affects smokers, former smokers and persons with diabetes. One complication of diabetes includes blockages in the small blood vessels of the legs. As a result, blood flow to one leg or both legs is decreased.

### **Other individuals who may be at risk for Vascular Disease include:**

- Anyone over the age of 45
- People with high cholesterol
- People with high blood pressure
- Those that have coronary artery disease
- People with a family history of coronary artery disease
- Those who are overweight
- People who lead a very sedentary lifestyle

## **How is vascular disease treated?**

We know there is no “magic cure” for vascular disease however, lifestyles change and medical treatment can greatly decrease long-term complications that can result if there is no intervention.

- **Exercise**

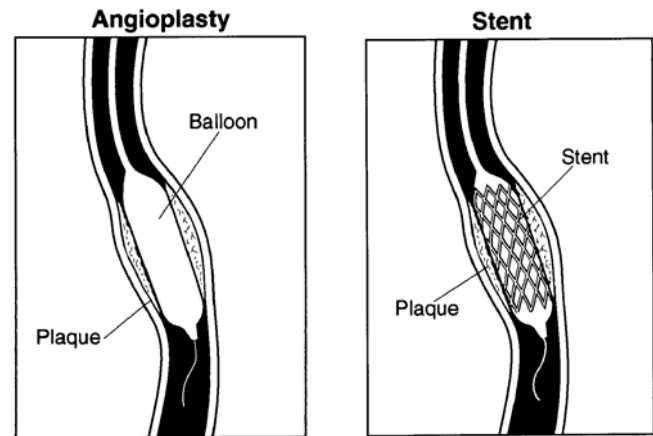
Exercise is the best non-surgical treatment for vascular disease if the blockages are not yet into the advanced stage. Exercise helps people with vascular disease by:

- ▶ Delaying the onset of claudication symptoms
- ▶ Developing new blood vessels (collateralization)
- ▶ Reducing the thickness of the blood
- ▶ Increasing blood flow to the leg
- ▶ Improving oxygen delivery to the working muscles during weight-bearing exercise
- ▶ Improving the benefits of walking by increasing your maximal walking distance
- ▶ Making your heart and lungs work better together to pump blood to the rest of the body

- **Surgery**

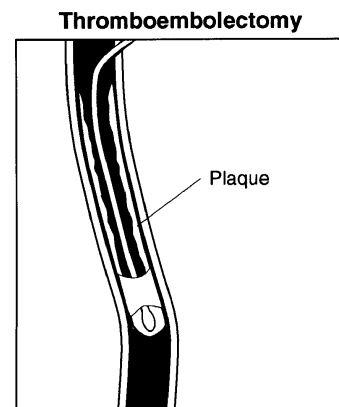
- Angioplasty / Stent**

Angioplasty is a procedure where a catheter with a small balloon attached to the end of it is put into a blood vessel. With the use of x-ray, the balloon is threaded to the area of the blocked vessel. The balloon is inflated to dilate or open the artery. In some instances, and expandable mesh-like structure (**stent**) is placed, which will help keep the vessel open by pushing against the inside of the artery wall.



- Thrombectomy**

A thrombectomy is done only when symptoms of vascular disease are due to a recent blood clot. A balloon is inserted above the affected area in the vessel and the clot is pulled away from that area and removed from the artery.

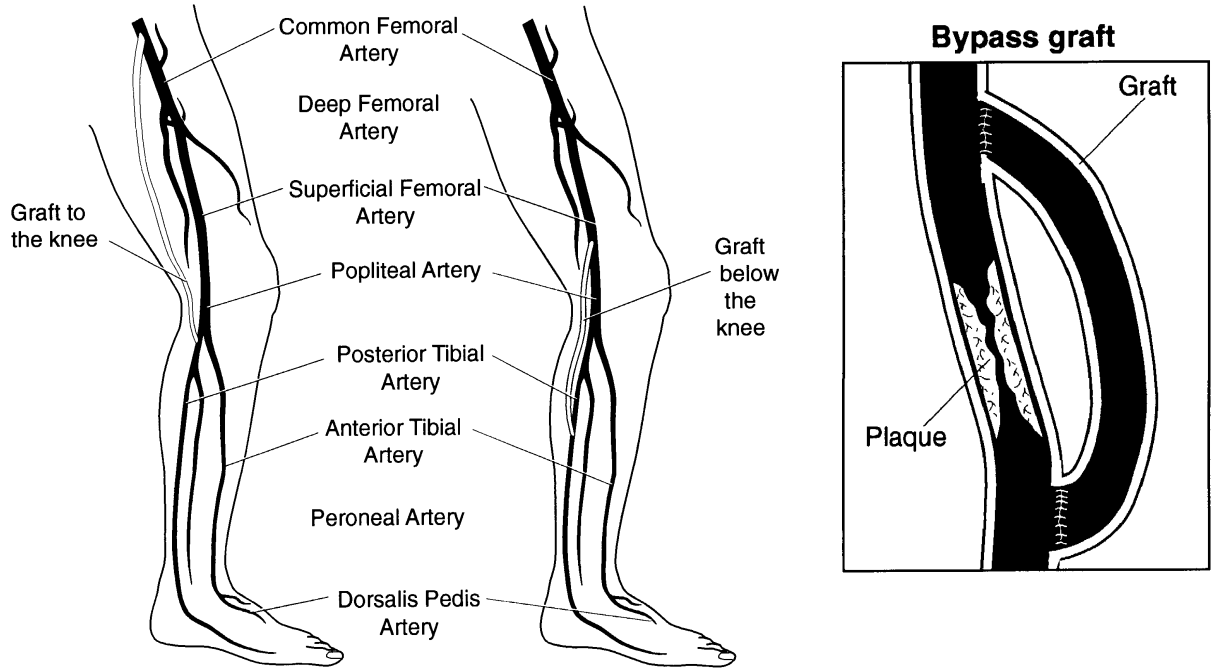


- Thrombolytic Therapy**

This therapy is a drug given through a vein (IV) when the artery has a recent blood clot. Thrombolytic drugs are usually used in combination with other treatments such as angioplasty or surgery.

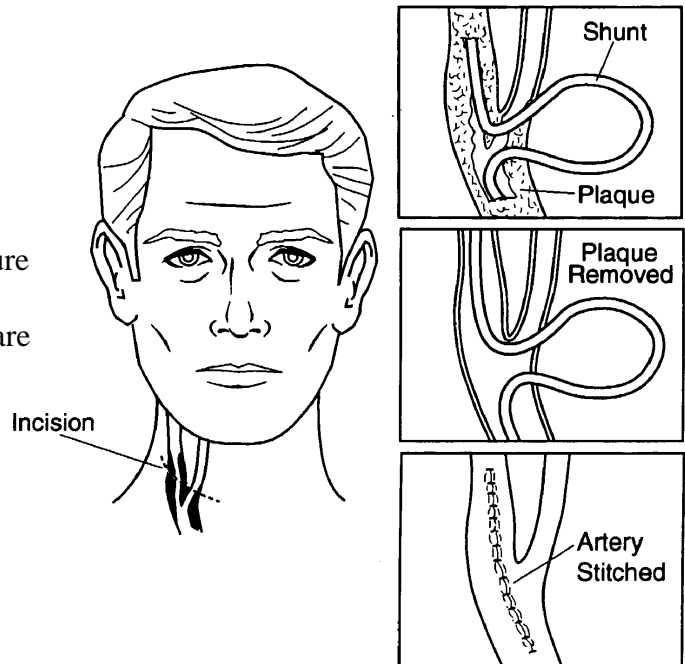
**□ Bypass Grafts**

A bypass graft is done to create a detour around a blocked artery. A vein from the same leg or an artificial material is used as the graft to bypass around the blocked artery. This surgery can treat the symptoms for a period of time but does not cure the underlying atherosclerotic condition.



**□ Carotid Endarterectomy**

An endarterectomy is a procedure where plaque build up in the carotid arteries in the neck are surgically removed.



**□ Aneurysm Repair**

An aneurysm is an enlargement or weakening of part of the artery wall. Surgery is used to replace that part of the artery that has the aneurysm with a graft of artificial material.

## ☐ Amputation

Amputation is the least desired method of treatment for vascular disease. It is reserved for use after all other treatments have been tried. It may be required if dead tissue (gangrene) is extensive, infection from decess tissue has spread into the bone (osteomyelitis), or all major arteries in the leg(s) are completely blocked making it impossible to do a bypass surgery.

## • Medications

Your health care professional will give you education materials and counsel you on those specific medicines that you will be taking.

- ▶ **Beta-blockers, calcium channel blockers, and thromboxane inhibitors** may be useful in controlling vascular disease symptoms by decreasing heart rate and blood pressure, and vasodilating or opening blood vessels. These medicines are also used to treat heart muscle pain (angina pectoris) as well as high blood pressure.
- ▶ **Aspirin and warfarin (Coumadin)** are used because of their ability to keep the clotting factors of your blood from sticking together (antiplatelet) and for blood thinning effects.

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- ▶ Upon request all patient education handouts are available in other formats for people with special hearing, vision and language needs, call (614) 293-3191.