

### An overview of the diseases affecting blood vessels

#### What is Vascular Disease?

Vascular Disease is the term that describes blood vessel diseases. Blood vessels are the series of tubes that are used to pump blood throughout the body. There are three types of blood vessels: arteries, veins and lymphatics. Arteries carry oxygen-rich blood away from the heart to every part of the body, including the brain, intestines, kidneys, arms, legs and the heart itself. When disease occurs in the arteries, it is called arterial disease. Veins return blood back to the heart from all parts of the body. When disease occurs in the veins, it is called venous disease. Lymphatics are a third type of blood vessel that return fluid from the skin and other tissues to the veins. This brochure explains some of the disorders that can occur in blood vessels.

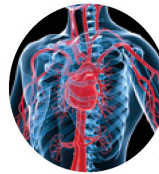
#### Atherosclerosis (Hardening or Narrowing of the Arteries)

**Atherosclerosis** (ath-er-o-skler-O-sis) is a disease in which plaque (plak) builds up on the insides of the arteries. Over time, plaque hardens around the artery walls, narrowing blood flow to the organs and other parts of the body. Without enough oxygen-rich blood, organs cannot work properly. In addition, blood clots often form around plaques. The plaque or clot can break loose and travel to smaller arteries, blocking blood flow. A plaque also can rupture. Blockages and plaque ruptures can lead to serious problems, including heart attack, stroke or even death. Atherosclerosis can be caused by many factors, such as smoking, high cholesterol and diabetes. It can occur in almost any artery and usually involves multiple arteries at the same time. It is commonly found in the coronary or heart arteries, the carotid (ka-ROT-id) or neck arteries and the leg arteries. It also can be found in the largest artery of the body, the aorta, which carries blood from the heart to the chest, abdomen and legs. Severe atherosclerosis may block an artery, causing ischemia (is-KE-me-ah), a restriction in oxygen-rich blood supply to any muscle group, organ or tissue. Two common results of ischemia are heart attacks and strokes.

Here are some of the diseases that can result from atherosclerosis:



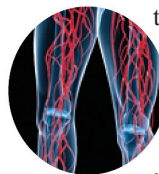
**Carotid Artery Disease** occurs when the major arteries in the neck become narrowed or blocked. These arteries, called the carotid arteries, supply blood to the brain. Significant narrowing increases the risk of plaque or a clot traveling to the brain, causing a stroke



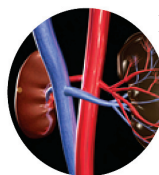
**Coronary Artery Disease (CAD)** is a condition in which plaque builds up inside the coronary or heart arteries. When coronary arteries are narrowed or blocked, oxygen-rich blood cannot reach the heart. In some cases, this causes chest pain, called angina (an-JI-nuh or AN-juh-nuh). In severe cases, it causes a heart attack, which is also called a myocardial infarction.



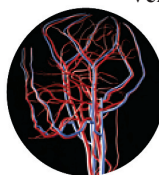
**Mesenteric Artery Disease** occurs when the major arteries to the intestines become narrowed or blocked. Symptoms include abdominal pain after eating, blood in the stool and weight loss.



**Peripheral Arterial Disease (PAD)** occurs when the leg arteries become narrowed or blocked. This condition is also called poor circulation or peripheral vascular disease. Without sufficient blood flow to the legs and feet, PAD patients can experience leg pain, ulcers or sores. Some patients with PAD have no symptoms and can only be diagnosed by a health-care provider. Severe PAD, called critical limb ischemia, can lead to amputation of part of the leg.



**Renovascular Disease** is a progressive condition that causes narrowing or blockage of the renal arteries, the blood vessels to the kidneys. Atherosclerosis of renal arteries can cause high blood pressure or kidney failure.



**Vertebrobasilar Insufficiency** is a disorder that affects the blood vessels to the back of the brain. Narrowing of the vertebral arteries may result in blurred or double vision, dizziness, and trouble with coordination or balance. It can also cause drop attacks, or sudden, spontaneous falls while standing or walking.

## Aneurysms

An **Aneurysm** (AN-u-rizm) is a balloon-like bulge in the artery caused by weakening in the artery wall. Aneurysms most often occur in the largest artery in the body, called the aorta, which carries blood from the heart to the chest, abdomen and legs. Aneurysms also occur in brain and leg arteries. A ruptured aneurysm is an emergency and requires immediate medical attention. An Aortic Aneurysm is caused by a progressive weakening of the aortic wall. This may cause a bulging or ballooning of the vessel, which may

continue to grow and even rupture if not treated.

An aneurysm in the abdomen is known as abdominal aortic aneurysm (AAA or triple A). An aneurysm in the chest is called a thoracic aortic aneurysm.

**Aortic Dissection** is a tear in the inner layer of the aortic

wall. This causes blood to flow between the layers of the wall of the aorta, forcing the layers apart. An aortic dissection often causes severe chest or back pain and may reduce blood supply to the organs or tissues. An aortic dissection is a medical emergency that can lead to death if not treated. An aortic aneurysm increases the risk of aortic dissection, although dissection also may occur when there is no aneurysm.

A **Brain Aneurysm** is a bulging or ballooning of a blood vessel inside of the brain. Brain aneurysms may cause severe headaches and can lead to a specific type of stroke, known as a hemorrhagic stroke, if the aneurysm ruptures. A hemorrhagic stroke is a bleed into the brain. This type of stroke is less common than a stroke due to atherosclerosis, but the symptoms are similar. A hemorrhagic stroke is more likely to occur if an aneurysm is in a brain artery.

## Venous Thrombosis (Blood Clot)

A **Venous Thrombosis** (throm-BO-sis) is a blood clot that forms in the veins. These venous clots can block the blood flow through the vein and can also travel to other parts of the body. Many factors can increase the risk of venous clots including trauma to the legs, injury to the veins, a recent surgery or hospitalization, obesity and prolonged immobility such as a long airplane ride or bed rest. Taking birth control pills, being a cancer patient and even pregnancy can also increase the risk of developing blood clots in the

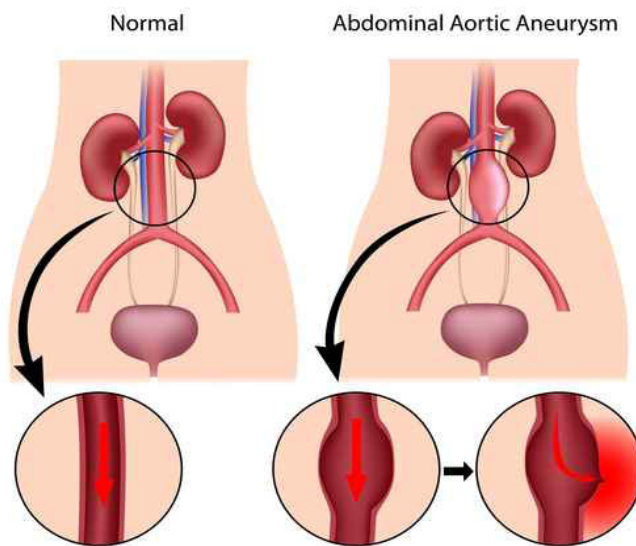
veins. In addition, people who have had a blood clot have a higher chance of having another. Clots can occur in both the arm and leg veins, but are more commonly seen in the legs. Most serious blood clots are treated with bloodthinner drugs, known as anticoagulants. Anticoagulants decrease the blood's ability to clot to a controlled degree. They stop clots from getting bigger and prevent new clots from forming.

**Deep Vein Thrombosis (DVT)** is the formation of blood clots within the deep veins of the arms or legs. In the legs, DVT occurs when a clot forms in one of the deep calf or thigh veins, blocking blood flow and causing pressure to build up in the vein. Symptoms include

pain and swelling in one or both legs. DVT in the arms, although rare, most often occurs in the large veins called the axillary and subclavian veins. Symptoms of arm DVT include arm swelling and pain, prominent veins that can be seen under the skin and skin color changes.

A serious complication of DVT is a condition called **Pulmonary Embolism (PE)**. This occurs when some or all of the DVT breaks free from its original site in a vein and travels through the heart into the lungs. Common symptoms of PE include difficulty breathing, chest pain, and heart palpitations or a racing heartbeat. PE is an emergency and requires immediate medical attention.

**Superficial Vein Thrombosis (SVT)** refers to a blood clot in a surface vein of the arm or leg, close to the skin. Blockages in the superficial veins are not as serious as those in the deep veins, but may cause swelling and discomfort.



## Varicose Veins and Venous Insufficiency

Veins carry blood from the arms and legs back to the heart to be resupplied with oxygen by the lungs. Veins have valves that prevent blood from flowing in the wrong direction. If these valves become damaged and fail to work properly, blood can flow backwards down the veins and pool in the lower leg. This leads to enlarged veins and may cause leg swelling, aching and burning, skin color changes and leg ulcers.

**Varicose Veins** are the visible, bulging veins, located in the thigh or calf. Generally, they are one-eighth inch in width or greater. Varicose veins develop due to weakness of the vein wall and because the valves no longer work. In some cases, varicose veins run in families. Two other conditions often mistaken for varicose veins are spider veins and reticular veins. Spider veins, also called teleangiectasia (teh-LANjick-TAY-sha), are the tiny veins that you can easily see but cannot feel. Reticular veins are larger than spider veins but smaller than varicose veins.

**Chronic Venous Insufficiency (CVI)**, a common cause of leg pain and swelling, is associated with deep vein thrombosis (DVT) and varicose veins. It occurs when the valves of the veins do not work properly, impairing blood circulation in the leg veins and pooling blood in the legs. Over time, CVI may result in worsening varicose veins, leg swelling and discoloration, itching and ulcers near the ankles.

## Lymphedema

**Lymphedema** is a disorder of the lymphatic blood vessels which leads to severe swelling of one or both of the legs or arms. In some cases, lymphedema is caused by damage of the lymphatic vessels, as may happen among women who have received surgery for treatment for breast cancer. In some cases, lymphedema is a disorder that runs in families and is diagnosed during childhood or young adulthood.



## Vascular Birth Defects

**Congenital Vascular Malformations (CVM)** are uncommon, abnormally formed blood vessels that are present at birth. CVM is an all-inclusive term for malformations, tumors and other congenital defects related to the blood vessels. Symptoms depend on the location of the CVM in the body and whether it

involves the vein, the arteries or both. Port-wine stains, a type of birthmark characterized by a reddish or purplish discoloration of the skin, are also a type of CVM.

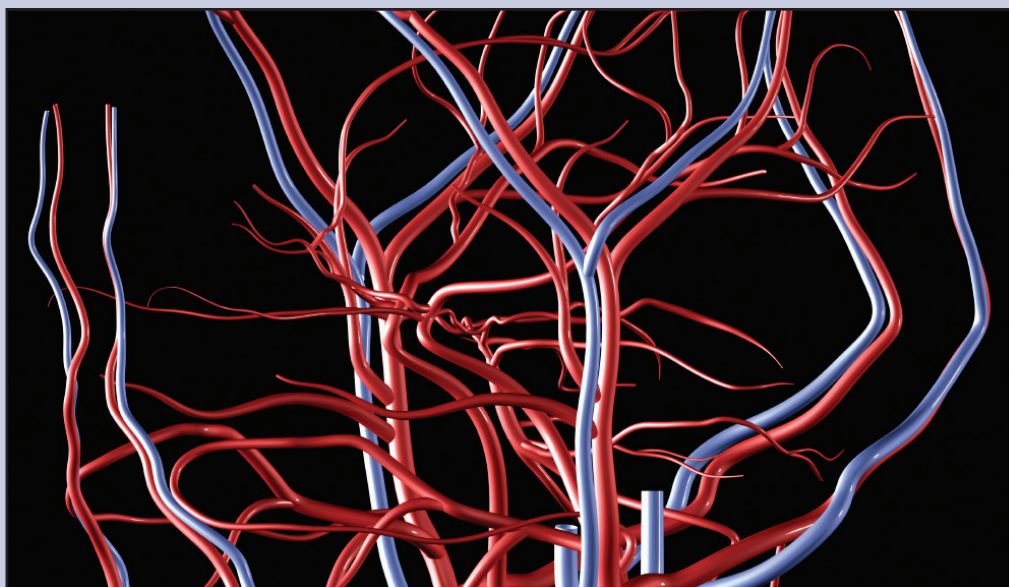


## Inflammatory Vascular Disease

**Vasculitis** is an inflammation of the blood vessels. With this uncommon condition, the body's immune system mistakenly attacks the blood vessels, causing them to become inflamed. Inflammation can damage the blood vessels and lead to the narrowing or blockage of blood flow. Inflammation can also lead to aneurysms of the blood vessels. Vasculitis can affect any of the body's blood vessels.

Vasculitis conditions involving the large blood vessels include **temporal arteritis**, also known as **giant cell arteritis**, and **Takayasu's arteritis**. Conditions that involve the medium blood vessels include **polyarteritis nodosa** and **Kawasaki disease**. Conditions involving the small vessels include **Churg-Strauss syndrome**, **hypersensitivity vasculitis**, **Behçet's syndrome** (Beh-CHETS) and **Wegener's granulomatosis** (VEGG-eh-nerz GRAN-u-luh-mah-TOE-sis). Some rheumatoid disorders, such as rheumatoid arthritis and lupus, also may cause vasculitis. In rare cases, certain infections may cause vasculitis.

**Buerger's Disease** is a rare disorder characterized by inflammation of the small and medium blood vessels in the arms and legs. It is also known as **Thromboangiitis Obliterans** (thrombo-an-gee-IT-es) or TAO. Swelling and clotting in the arteries can block or reduce blood flow to the fingers and toes. This usually leads to pain at rest or with exercise. TAO can also lead to ulcers or slow healing sores on the fingers and toes. Buerger's Disease is strongly linked to smoking; nearly everyone diagnosed with it smokes cigarettes or uses some other form of tobacco.



## Other Vascular Conditions

**Vascular Steal** occurs when blood through an artery bypasses its normal flow path, reducing blood flow to its intended area of the body. Most often this occurs when there is a blockage in the artery that supplies blood to the arm, known as the subclavian artery. In cases of severe blockage of the subclavian artery, the arm can steal blood from the vessels supplying the brain leading to dizziness.

## Vasospasm

**Raynaud's phenomenon** is a disorder that causes arteries to go into spasm for brief periods. Called vasospasm, the contraction or narrowing of the blood vessels decreases blood flow to fingers and toes. In some cases, it can affect the nose, ears, nipples and lips. The reduced blood flow can lead to color changes in the affected area, and some patients report that their fingers turn white, blue and/or red. Vasospasm usually occurs in response to cold temperatures, but also can be triggered by stress. Mild Raynaud's phenomenon is common among young women. Severe Raynaud's phenomenon is rare, but may lead to ischemia of the hands or feet and non-healing sores.

**Compression Syndromes** occur when blood vessels are narrowed or compressed by bones, muscle or other body tissues. With Thoracic Outlet Syndrome (TOS), blood vessels and nerves of the arms are compressed as they leave the chest cavity by the surrounding bones and muscles. If the nerves are affected, TOS may cause pain or numbness in the arms with certain movements. If the blood vessels are affected, it may cause arm swelling or a blood clot. With Popliteal Entrapment Syndrome, compression of the popliteal artery or popliteal vein in the back of the knee by the calf muscles may cause leg pain with exercise or a blood clot in the leg.

This educational resource was created by the Vascular Disease Foundation (VDF). VDF ceased operations in January 2014. In October 2014, Vascular Cures acquired most of VDF's digital assets and educational resources. VDF was founded in 1998 with the mission to provide public education and improving awareness about vascular diseases. Vascular Cures is now the only organization in the country dedicated exclusively to finding cures for vascular disease and to providing resources, information and education to patients with vascular diseases outside the heart. Please help Vascular Cures continue to make this critical educational information available. Your contribution will make saving lives a greater reality. Make a donation today at: [www.vascularcures.org](http://www.vascularcures.org).

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