

Vascular Tests and Studies

What is vascular testing?

Vascular tests look at the blood flow in the arteries and veins (blood vessels). Some tests are non-invasive. This means the equipment used does not enter your body.

Arteries carry blood from your heart to your body organs and tissues. The organs and tissues use the nutrients (such as vitamins) and oxygen in this blood. The blood carries away waste products and is returned through veins to your heart. This is called circulation.

Why do I need vascular testing?

These tests are done to see if you have vascular disease (problems in your arteries or veins).

If your arteries are blocked or stenosed (narrowed), they may not be able to carry enough blood to your brain, legs, and other organs. This can cause many problems, including leg wounds that don't heal, strokes, and peripheral arterial disease (blocked leg arteries).

Vein problems, such as venous insufficiency, happen when the vein valves weaken and do not close well, or if you are born without valves. Blood then flows in the wrong direction, back down the vein and into the leg. This blood collects in the veins and causes them to get larger. It also causes high pressure in the veins, and that can keep wounds from healing. People with this problem usually get wounds on the legs or top of the foot.

What tests may be done?

Non-Invasive Flow Studies (NIFS)

NIFS are tests done to see if the arteries in your legs have good blood flow. Non-invasive means the equipment used does not enter your body. Some or all of these tests may be ordered for you:

- **Ankle-Brachial Index (ABI)** is the main test used to measure blood flow in the arteries. Blood pressure cuffs are placed on the arms and legs. The blood pressures are taken using a Doppler (ultrasound) stethoscope. Then the blood pressure in your leg is compared to the blood pressure in your arm. This ratio is called an ABI.
You may then be asked to walk on a treadmill for as long as you can, and we will check your arm and ankle blood pressures once again. This is called a **Treadmill Exercise Test**. It gives us even more information about the blood flow in you legs.
- **Doppler Studies** use ultrasound (sound waves) to look at blood flow in arteries and veins. These studies can see if blood flow in an artery is decreased or blocked. It can also show blood clots in veins. It is painless and harmless. A gel is placed on your skin then a probe (smooth metal device) is moved over the area being examined. We listen for swishing sounds made by blood moving through the vessels and watch the blood flow on a monitor.

- **Arterial or Venous Duplex Doppler Ultrasound** looks at the flow of blood through arteries and veins. It is done using regular doppler ultrasound and Duplex Doppler ultrasound, which can see moving objects such as blood flow.
- **Segmental Pressures with Doppler** can see if any arteries are blocked. It can measure how much an artery is blocked. Blood pressure cuffs are placed at the thigh, calf, ankle and foot. Then, using Doppler ultrasound, pressure measurements are made and the amount of blood flow is recorded.

Venous Reflux Studies

Venous reflux studies use ultrasound (sound waves) to check the blood flow in your veins.

Veins are the vessels through which blood flows from different parts of your body back towards your heart. Veins have one-way valves inside them that help the blood flow back to the heart. Normally, blood flows from veins near the surface of your legs inward to the deep veins in the center of the leg. It then flows up and back to the heart. In patients with damaged or weak veins, the blood flows in the opposite direction and presses outwards from the deep veins to the superficial ones. This causes high pressure in the superficial veins and can delay wound healing. We order venous reflux studies for patients who have leg wounds, since these are usually due to problems in the veins.

- **Magnetic Resonance Angiogram (MRA)** can also be used to look at blood flow in the arteries. Radio waves and a computer are used to make pictures of the blood flow. A contrast ('dye') is injected into an arm or hand vein for this exam.
- **Angiogram** is an X-ray exam of the blood vessels in the legs. This is an invasive test. A contrast ('dye') is injected through a small catheter (thin flexible tube) into the arteries and pictures are taken. These pictures show how well the blood flows through the arteries, and any blocked or narrowed arteries.

What do I do if I have a question?

If you are confused or have a question about vascular tests and studies, please call us at 212.932.4325, at any time. You can also find information at our website: www.ColumbiaWoundHealing.org.

This information is brief and general. It should not be the only source of your information on this health care topic. It is not to be used or relied on for diagnosis or treatment. It does not take the place of instructions from your doctor. Talk to your health care providers before making a health care decision.