

Vascular Ultrasound Studies

A vascular ultrasound study is used to diagnose and detect diseases of the blood vessels. There are no needles, radiation, dyes, or anesthesia involved. To accurately find any problems, we need two pieces of information:

1. An image of the blood vessel. This is obtained by using **ultrasound** to generate a picture on the computer monitor. Ultrasound is sound waves at a higher frequency than the sound waves that humans can hear.
2. Information about the blood flow through the blood vessel. This is obtained by using **Doppler** so that we can see and hear the blood flow.

These two pieces of information are obtained at the same time by using a smooth probe called a transducer that is connected to the ultrasound machine. This is called **Duplex Scanning**. The transducer is a microphone-like device that sends ultrasound waves into your body. The ultrasound waves “bounce” off structures in your body and are reflected back to the transducer. The reflected waves tell the machine what kind of image to produce. Ultrasound waves do not travel through air so we need a “coupling gel” for the ultrasound waves to travel from the transducer to your body. This gel will be applied to your skin at the area to be examined. It is colorless and should not stain you or your clothing. This gel should not cause any irritation to your skin.

CAROTID DUPLEX

The carotid arteries are located in your neck and allow blood to travel to the brain. The carotid duplex scan uses ultrasound to produce an image of the arteries and Doppler to obtain information about the blood flowing to your brain. At various times during the exam, you will hear the sound of blood flowing through the carotid arteries. You will lie comfortably on your back with your head turned slightly away from the side being examined. For this test you should wear a comfortable shirt with a loose collar.

ARTERIAL DOPPLER

For the evaluation of arteries that supply blood to the arms and legs, we obtain blood pressures at different levels of the arms and legs. The technologist will listen to your blood flow going through the arteries in your legs or arms and then will apply blood pressure cuffs around your legs or arms at different levels. Depending on what the blood pressures are, you may be asked to walk on a treadmill for up to 5 minutes. Immediately after you walk on the treadmill, blood pressures will be obtained at your arm and ankle levels. You will lie comfortably on your back and may be asked to rotate your legs slightly to the side.

ARTERIAL DUPLEX

The arterial duplex scan uses ultrasound to produce an image of the arteries and Doppler to listen to the blood flowing through the arteries that supply your arms or legs. You will lie comfortably on your back and may be asked to rotate your legs slightly to the side.

VENOUS DUPLEX

This is used to evaluate the veins that carry blood to the heart from the arms or legs. The venous duplex scan uses ultrasound to produce an image of the veins and Doppler to listen to the blood flow through the veins in the arms or legs. The technologist will press down on the transducer at various times to see how the vein wall responds to compression. Also, the technologist will squeeze your legs at various places to see how the blood flow responds while being forced in different directions. You will lie comfortably on your back and may be asked to rotate your legs slightly to the side.

AORTA DUPLEX

The aorta is the main artery that carries blood from the heart to the rest of your body. The aorta duplex evaluates the portion of the aorta that runs through your abdomen or belly. The size of the aorta and information about the blood flow through the aorta is obtained. You will lie flat, on your back, for this test. Prior to this test you must not eat for 8 hours, or overnight, so that pictures can be obtained with interference from food.

RENAL ARTERY DUPLEX

The renal arteries are the main arteries that supply your kidneys with blood. The renal artery duplex is used to obtain information about the arteries and also to obtain information about the flow through the renal arteries and about the flow through the kidneys. The technologist may ask you to lie on your side at times and will ask you to hold your breath at various times during the exam. Prior to this test you must not eat for 8 hours, or overnight.

MESENTERIC ARTERY DUPLEX

This is a duplex scan of the main arteries that feed the "gut" – the arteries that supply the organs responsible for digestion of food. The mesenteric duplex provides information about the anatomy of these blood vessels as well as information about the blood flow through these vessels. It is important that you are fasting for this test. You must not eat anything for at least 8 hours prior to this test.

VEIN MAPPING

This is an ultrasound exam that measures the size of superficial veins in the legs or arms. This information is sometimes needed if a surgeon is planning to use a vein for bypass surgery. The size of the vein in diameter is obtained as well as information about the vein to see if the vein can be used for an adequate bypass vessel.

RADIAL ARTERY MAPPING

The radial arteries are located in your forearm, from your elbow to your wrist and carry blood up your arm. This is an ultrasound exam that measures the size in diameter of the radial artery and provides information about the blood flow through the radial artery. Sometimes a surgeon may consider using these arteries for bypass surgery of your heart and the information provided by radial artery mapping helps the surgeon decide if the radial artery can be used