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For patients

Ultrasound - Carotid

Carotid ultrasound uses sound waves to produce pictures of the carotid arteries in the neck which carry blood from the heart to the brain. A Doppler ultrasound study – a technique that evaluates blood flow through a blood vessel – is usually part of this exam. It's most frequently used to screen patients for blockage or narrowing of the carotid arteries, a condition called stenosis which may increase the risk of stroke.

Little or no special preparation is required for this procedure. Leave jewelry at home and wear loose, comfortable clothing. A loose-fitting, open necked shirt or blouse is ideal.

What is Carotid Ultrasound Imaging?

Ultrasound imaging is a noninvasive medical test that helps physicians diagnose and treat medical conditions. It is safe and painless. It produces pictures of the inside of the body using sound waves. Ultrasound imaging is also called sonography (http://www.radiologyinfo.org) . It uses a small probe called a transducer and gel placed directly on the skin. High-frequency sound waves travel from the probe through the gel into the body. The probe collects the sounds that bounce back. A computer uses those sound waves to create an image. Ultrasound exams do not use radiation (http://www.radiologyinfo.org) (x-rays (http://www.radiologyinfo.org)). Because ultrasound captures images in real-time, it can show the structure and movement of the body's internal organs. The images can also show blood flowing through blood vessels.

An ultrasound of the body's two carotid arteries, which are located on each side of the neck and carry blood from the heart to the brain, provides detailed pictures of these blood vessels and information about the blood flowing through them.

A Doppler ultrasound study is usually an integral part of a carotid ultrasound examination

Doppler ultrasound (http://www.radiologyinfo.org) is a special ultrasound technique that evaluates movement of materials in the body. It allows the doctor to see and evaluate blood flow through arteries and veins in the body.

What are some common uses of the procedure?

The carotid ultrasound is most frequently performed to detect narrowing, or stenosis (http://www.radiologyinfo.org) , of the carotid artery, a condition that substantially increases the risk of stroke (http://www.radiologyinfo.org) .

The major goal of carotid ultrasound is to screen patients for blockage or narrowing of their carotid arteries, which if present may increase their risk of having a stroke. If a significant narrowing is detected, a comprehensive treatment may be initiated.

It may also be performed if a patient has high blood pressure or a carotid bruit (http://www.radiologyinfo.org) (pronounced brU-E)—an abnormal sound in the neck that is heard with the stethoscope. In some cases, it is also performed in preparation for coronary artery bypass surgery.

Other risk factors calling for a carotid ultrasound are:

- diabetes
- elevated blood cholesterol
- a family history of stroke or heart disease

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A carotid ultrasound is also performed to:

- locate a hematoma (http://www.radiologyinfo.org) , a collection of clotted blood that may slow and eventually stop blood flow.
- check the state of the carotid artery after surgery to restore normal blood flow.
- verify the position of a metal stent (http://www.radiologyinfo.org) placed to maintain carotid blood flow.

Doppler ultrasound helps the doctor to see and evaluate:

- blockages to blood flow (such as clots)
- narrowing of vessels
- tumors and congenital vascular malformations
- reduced or absent blood flow to various organs, such as the testes or ovary
- increased blood flow, which may be a sign of infection

In children, Doppler ultrasound is used to:

- evaluate blood flow.
- predict a higher risk of stroke in children with sickle cell disease.
- detect abnormalities in the blood vessels, lymph nodes and lymphatic vessels.

Who interprets the results and how do I get them?

A radiologist, a doctor trained to supervise and interpret radiology exams, will analyze the images. The radiologist will send a signed report to the doctor who requested the exam. Your doctor will then share the results with you. In some cases, the radiologist may discuss results with you after the exam.

You may need a follow-up exam. If so, your doctor will explain why. Sometimes a follow-up exam further evaluates a potential issue with more views or a special imaging technique. It may also see if there has been any change in an issue over time. Follow-up exams are often the best way to see if treatment is working or if a problem needs attention.

What are the benefits vs. risks?

Benefits

- Most ultrasound scanning is noninvasive (no needles or injections).
- Occasionally, an ultrasound exam may be temporarily uncomfortable, but it should not be painful.
- Ultrasound is widely available, easy to use, and less expensive than most other imaging methods.
- Ultrasound imaging is extremely safe and does not use radiation.
- Ultrasound scanning gives a clear picture of soft tissues that do not show up well on x-ray images.
- If a carotid ultrasound exam shows narrowing of one or both carotid arteries, treatment can be taken to restore the free flow of blood to the brain. Many strokes are prevented as a result.

Risks

- Standard diagnostic ultrasound (http://www.radiologyinfo.org) has no known harmful effects on humans.
- In nearly 50 years of experience, carotid ultrasound has proved to be a risk-free procedure.

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What are the limitations of Carotid Ultrasound Imaging?

- Carotid ultrasound may be difficult or impossible if a patient has a dressing covering a wound or surgical scar in the neck.
- An occasional patient is difficult to examine because of the size or contour of the neck.
- Calcium deposits in the wall of the carotid artery may make it difficult to evaluate the vessel.
- A small amount of soft plaque (http://www.radiologyinfo.org) that produces low-level echoes may go undetected.
- Ultrasound cannot visualize the entire length of the vessel because the last portion of the carotid artery travels though the bone at the base of the skull. For a more complete assessment, patients may need to undergo a CT or MRI of the carotid arteries.

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