

Transcranial Doppler and Bubble Studies

What is a transcranial Doppler study?

A transcranial [trans-CRAY-nee-uhl] Doppler (TCD) study uses sound waves to see how blood flows to and in your brain. As the sound waves bounce off blood vessels, information is sent to a computer screen. The results of a TCD study can help your doctor find problems that might keep your brain from getting enough oxygen, which is delivered by the blood.

What is a bubble study?

A bubble study is a TCD study that includes injecting tiny bubbles into a blood vessel. The sound waves show if the bubbles reach your brain.

If bubbles reach the brain, it may be caused by an abnormal opening between two chambers of the heart. This opening can allow blood clots to pass through and cause a stroke.

Talking with your doctor about these tests

The table below lists the most common possible benefits, risks, and alternatives for TCD and bubble studies. Other benefits or risks may apply in your unique medical situation. Talking with your doctor is the most important part of learning about these tests. If you have questions, be sure to ask.

Why might I need a TCD or bubble study?

Your doctor might suggest one of these tests if you have had:

- A stroke or a TIA (mini-stroke), with symptoms such as numbness or weakness, confusion, trouble seeing, headache, or loss of coordination
- A brain aneurysm [an-yuh-RIZ-uhm] (weakness or bleeding from a blood vessel in the brain)
- Many migraines (very bad headaches)
- Brain trauma (injury)

OR

- Have arteries that are narrowed by plaque [plak] (fatty buildup), tiny blood clots, or a spasm [SPAZ-uhm] (tightening)
- Have unexplained blood clots or a low blood oxygen level
- Are taking medicine to prevent blood clots (called anticoagulation [an-ty-koh-ag-yoo-Lay-shun])
- Are having surgery that can affect blood flow to the brain

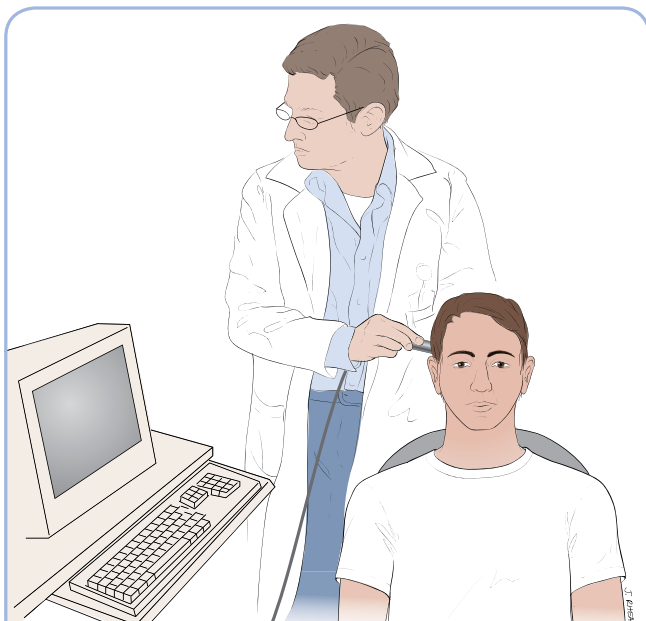
Possible benefits	Possible risks and complications	Alternatives
A TCD or bubble study can: <ul style="list-style-type: none"> • Identify whether spasms, clots, or plaque are blocking blood flow to the brain • Identify whether you have an abnormal opening inside your heart 	TCDs and bubble studies are very safe. Risks include: <ul style="list-style-type: none"> • Minor pain or infection at the IV site (during a bubble study) • Stroke or blood clot in the lungs (extremely rare) 	Alternatives to a TCD study may include an MRI or CT scan. Alternatives to a bubble study may include echocardiogram, MRI, or cardiac catheterization.

What happens during a TCD study?

A TCD study takes about an hour. During a TCD study that looks for **blood vessel narrowing or spasms**, the technician will put a gel on your skin and move a hand-held device called a **transducer** across the area to be studied. This may include one or more of these areas:

- The sides of your head above your ears
- Under your chin
- The hollows in the back of your neck (you'll sit or lie on your side and hold your head down)
- On your closed eyelids (the gel won't hurt your eyes, and the transducer is moved very lightly over the skin)

During a TCD study that looks for **tiny blood clots**, the technician will hold a transducer against your head (or you will wear a headset) and listen to the arteries inside your brain for up to an hour.

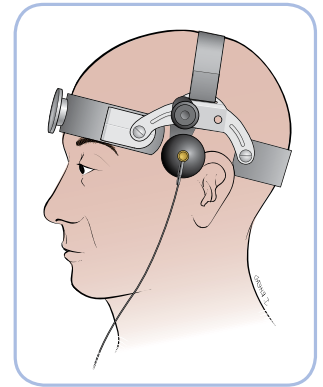


TCD and bubble studies use sound waves (ultrasound) to see how blood flows to and in your brain. The test is safe and painless.

What happens during a bubble study?

A bubble study takes about 20 to 30 minutes. During the test:

- An **IV (intravenous line)** will be placed in your wrist or arm. The technician will prepare the area to be tested by putting a small amount of gel on the skin.
- The technician will fit you with a **transducer headset**. The transducers in the headset send out sound waves to see if any bubbles reach your brain.
- The technician will inject a **salt water (saline) solution** that contains tiny bubbles into your IV, while you sit or lie still.



What happens after the test?

Your doctor will analyze the test. You'll get the results in a later appointment.

My follow-up appointment

Date / Time: _____

Place: _____

Doctor: _____

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