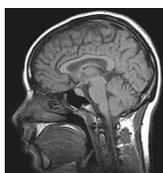


### What is an MRI?

Magnetic resonance imaging (MRI) is a diagnostic test that uses a powerful magnet and radio wave pulses to create detailed images of body tissue. The test does not require entering the body (it is noninvasive). The images produced by MRI allow doctors to clearly see changes in brain tissue and blood flow that are too small to see on a [CT scan](#) or [ultrasound](#). MRI tests are used to identify damage caused to the brain by stroke, including bleeding and blood flow problems caused by blood clots or blood vessel abnormalities. An MRI can also rule out other diseases of the brain, such as tumors.



An MRI image of the head

### What is MRA?

Magnetic resonance angiography (MRA) is a special type of MRI test that focuses on blood flow and the blood vessels of the brain, instead of on all brain tissue like a standard MRI. It can detect narrowing or blockage of the blood vessels inside and outside the brain—such as the carotid arteries in the neck—especially when it is used together with [carotid](#) or [transcranial Doppler ultrasound](#).

MRA can also be used to confirm a blockage seen in other MRI scans. MRA is useful in detecting weakening or ballooning of the blood vessels (aneurysms), which can lead to bleeding in the brain.

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Some, but not all, MRA tests use injections of a special dye to produce more detailed images of the blood vessels in the brain.

### What other types of MRI tests are there?

The two main variations of a standard MRI are *diffusion* MRI and *perfusion* MRI. These tests use an MR imaging machine and special techniques to process the data differently, highlighting specific features of the brain tissue.

Diffusion MRI measures the movement of water in the brain. Under normal conditions, water moves freely; when blood supply to the brain is interrupted, brain tissue swells and slows the movement of water. A diffusion MRI scan can pinpoint which area of the brain is getting little or no blood supply within minutes of a stroke, faster than any other imaging test.<sup>2</sup> It can also measure how much brain tissue was damaged by the stroke and how recently the damage occurred. When diffusion MRI is available at the hospital it may be used as the first test to diagnose acute stroke.

<sup>2</sup>

Perfusion MRI uses a rapid injection of a small amount of dye that circulates in the bloodstream and shows if your brain is receiving enough blood. It can generate a map of the amount and speed of blood flowing throughout the brain. Perfusion MRI can be done together with diffusion MRI to provide information about how much brain tissue has been damaged permanently and how much can still be saved.<sup>3</sup> However, the perfusion MRI maps take extra time, and for now it is an optional test to evaluate an acute stroke.

<sup>2</sup>

[Next: Who might have an MRI?](#)

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