

## Magnetic Resonance Imaging (MRI, MR)

MR is a way of imaging the inside of the body using a combination of magnetic fields and radio waves. For some MR tests you need to have gadolinium injected into an arm vein. MRI machines look a lot like CT scanners—you lie on a table that then slides into a hole in the machine. The difference is that the hole is more like a tunnel, which is sometimes a problem for people who are claustrophobic. MRI machines also make a lot more noise than CT scanners. One thing to keep in mind is that you should not have any kind of MRI test for up to four weeks after having an embolization of pulmonary AVMs with stainless steel coils. This is because strong magnetic fields can exert a weak effect on the coils and theoretically, this can make them move. If you wait a few weeks, the body will have had enough time to stick those coils in place with a bit of scar tissue, so there's no chance of a problem. If your embolization was done with platinum coils, you can have an MRI any time—magnetic fields have no effect on platinum.

## Magnetic Resonance Angiography (MRA)

This can be a bit confusing because even though the word angiography appears in the name, Magnetic Resonance Angiography isn't really angiography at all! MRA is a special type of MRI that gives us fairly detailed information about the circulation. MRA is most frequently done in order to have a look at the circulation around the brain. The test is done just like an MRI—you lie on a table and the machine takes pictures using the same magnetic fields and radio waves as an MRI. The computer uses some very high-tech programs to take the information from the machine and create pictures of the circulation. The reason this test is called Magnetic Resonance Angiography is not because it is done like an angiogram, but because the pictures that the machine gives us look very similar to the pictures we get when we do a real angiogram. If MRA can give us pictures like angiograms, then why do we still do angiograms? That's a good question. The fact is that while MRA gives us quite a bit of information about blood vessels, angiograms still give us the most detail of all. So, if an MRA is abnormal, it is possible that an angiogram might still be necessary in order to figure everything out. Also, an MRA can't show us the pulmonary circulation properly so we still need to do angiography for the blood vessels in the lungs.

## Imaging With and Without Contrast

An MRI without gadolinium is typically done first since migraines and TIA's (small strokes) demonstrate Hyperintensities (white spots) which are indicative of past strokes or complicated migraines. It is a good baseline in patients with PAVM's. In patients with CAVM's, there may be "hyperintensities" or white spots but they will ENHANCE or light up after administration of gadolinium.

The CAVM section of the Clinical Guidelines for HHT (bottom paragraph, last sentence), states "*MRI is less sensitive for the detection of micro AVMs, but the addition of contrast enhancement (currently gadolinium for patient > 2 years of age) to MRI does increase the sensitivity for detection of micro AVMs.*"