

MAGNETIC RESONANCE ANGIOGRAPHY (MRA) SCAN

AT CHILDREN'S HOSPITAL OF PITTSBURGH OF UPMC, we believe parents and guardians can contribute to the success of this test and invite you to participate. Please read the following information to learn about the scan and how you can help.

Fast Facts About MRA Scans

- The magnetic resonance angiography (MRA) scan takes very clear, detailed pictures of the blood vessels, including arteries and veins, using a magnetic resonance imaging (MRI) machine. The MRA may be included as an extra test when an MRI scan is ordered, or may be ordered by itself.
- The MRA scan does not use radiation but uses powerful magnets, so it is very important to know if your child has any metal in his or her body. Metal can include a pacemaker; a heart valve replacement or cardiac stent; a pin to repair a broken bone; any kind of dental or ear implant; and all ear and body piercings. Your child must also remove any jewelry or hair accessories that contain metal.
- Women who are pregnant or believe they may be pregnant should not be in the exam room when an MRA scan is done. In this case, please bring another adult who can stay with your child during the scan.
- Teenage patients who are pregnant or believe they may be pregnant should talk to their doctor before they have an MRA scan. This information will be kept confidential.
- Young children who might not be able to stay still for the entire scan can be given sedation medication to help them sleep during the scan.
- If your child is scheduled for sedation, there are important rules for eating and drinking that must be followed in the hours before the scan.
- The MRA scan may take between 1 to 2 hours, depending on the body area or part that is undergoing the test.
- A special intravenous (IV) dye called "contrast" is frequently used for the MRA test to help parts of the body show up better during the scan. It is very important to let the technologist or doctor know if your child has any allergies to iodine; has had a prior reaction to contrast; or has asthma, kidney disease or sickle cell anemia.

Fast Facts About Sedation

- If your child receives sedation medication, he or she will not feel anything during the scan or remember it afterward.
- Either a physician's assistant (PA) or a certified registered nurse practitioner (CRNP) will prescribe the sedation medication for



your child. A pediatric radiology nurse will give your child the sedation medication under the supervision of a doctor.

- Sedation medication will be given either orally through the mouth or directly into a vein through an IV line, depending on your child's age. There are no inhaled medications given.
- While your child is under sedation during the scan, your child's heart rate, blood pressure, temperature, and blood oxygen level will be watched continuously by a pediatric radiology nurse.
- A supervising pediatric radiology doctor is always nearby when sedation medication is given.

What Is MRA?

Magnetic resonance (*REZ-oh-nentz*) angiography (*an-gee-OG-gruff-ee*) or MRA is done with the same equipment as magnetic resonance imaging or MRI. While an MRI machine uses powerful magnets, invisible radio waves and a computer to scan the body and take pictures of organs and other structures, MRA uses that same machine to take clear, detailed pictures of the blood vessels.

- The MRI gives very detailed pictures of tendons and other organs, such as the brain, because the imaging waves pass through the bones.
- The MRA gives pictures of specific arteries and veins that your child's doctors want to look at.
- These detailed pictures give doctors information that they cannot learn from a physical examination.
- The MRI and MRA scans do not involve radiation exposure and do not hurt.

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Home Preparation

You may want to bring along a “comfort” item—such as a favorite stuffed animal or “blankie”—for your child to hold during the scan.

If the area of the body being scanned is above the shoulders, your child should not wear any makeup, jewelry or hair accessories or use any hair products, such as mousse, gel or hair-spray, as they may affect the scan.

Depending on what part of your child’s body is being scanned, there may be other important instructions on things to do or not do the day before and the day of your child’s MRA scan. Please follow the specific instructions given to you by your doctor before the scan.

If your child is having sedation, there are important rules for eating and drinking that must be followed in the hours before the test. One business day before your child’s scan, you will receive a phone call from a nurse. Please have paper and a pen ready to write down these important instructions.

- The nurse will give you specific eating and drinking instructions for your child based on your child’s age. Following are the usual instructions given for eating and drinking. No matter what age your child is, you should follow the specific instructions given to you on the phone by the nurse.

For children older than 12 months:

- After midnight the night before the test, do not give any solid food or non-clear liquids. That includes milk, formula, juices with pulp, chewing gum or candy.
- Your child may have **ONLY** water, Pedialyte® or apple juice up to two hours before the **scheduled time**.
- Your child should not drink anything carbonated (such as pop).

For infants under 12 months:

- Up to 6 hours before the **scheduled arrival time**, formula-fed babies may be given formula.
- Up to 4 hours before the **scheduled arrival time**, breastfed babies may nurse.

For all children:

- Up to 2 hours before the **scheduled arrival time**, give only clear liquids. Clear liquids include water, Pedialite®, Kool-Aid® and juices you can see through, such as apple or white grape juice.
- In the 2 hours before **scheduled arrival time**, give nothing to eat or drink.

The MRA Scan

Upon registration at the Division of Pediatric Neurology at Children’s Hospital, you will be given directions to the MRI Center. The MRI Center itself is located at Presbyterian University Hospital, which is directly connected to Children’s Hospital. One parent or guardian is welcome to stay with your child in the exam room and scanner room during this test.

Your child’s scan will be done by an MRI technologist who is specially trained to do scans on children. The results of the scan will be read by the pediatric radiology doctors at the Department of Pediatric Radiology at Children’s Hospital and then reported to the neurology doctors at the Division of Pediatric Neurology at Children’s Hospital.

Prior to the test, your child will be screened for any metal inside or outside his or her body. If your child’s clothing contains metal, such as zippers or rivets, he or she may be asked to change into a hospital gown. You and your child will be able to keep any personal belongings that contain metal in a secure locker during the scan.

In the scan room will be the MRI machine. You will see a long table that will slide into the tube-shaped or tunnel-like scanner where the camera is located.

- Your child will be asked to lie down on the table.
- The technologist will place a wide strap across your child’s waist to help your child stay still during the test. If your child is having a scan of his or her head, the MRI technologist will help put his or her head into an open “headcoil,” which looks like a helmet.
- Once your child is in position on the table, the MRI technologist will move the table into the MRI machine so that the body part of your child that is being tested is under the camera.
- The MRI machine will make loud banging and knocking noises during the scan. You and your child will be given a set of foam earplugs to help protect your ears from the noise of the scanner.
- At times during the MRA scan, the staff will not be in the scanner room with you, but will be in a room nearby where the equipment controls are located. They will be able to see you and your child through a large window and will be watching him or her constantly during the scan. An inter-com system will allow you to talk to them and vice versa.



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- Once the scan begins, your child will need to stay very still at all times to make sure the pictures turn out clearly. At certain times, your child will be asked to hold his or her breath for a few seconds. The staff will then tell your child when to breathe out.
- MRA scans sometimes need a special liquid dye.
 - This liquid dye is called “contrast.” If your child has ever had a reaction to any contrast dye, or if he or she is allergic to iodine, please let your doctor know immediately.
 - The contrast will be given to your child by a nurse through an IV line placed in a vein in your child’s hand, arm or foot, depending on his or her age.
 - If your child is awake during the MRA, just after the contrast goes into the vein, he or she may feel a flush of warmth as well as a funny taste in the back of his or her mouth. The warm feeling and the funny taste are normal and will go away shortly.
- When the scan is finished, the table will slide out of the scanner. Any monitoring equipment will be disconnected, and your child will be helped off of the table.
- If your child was awake during the MRA and an IV was placed for contrast, it will be taken out by a nurse after the scan.
- If your child received sedation medication, he or she will be taken by a nurse to the recovery area to be watched until the medication wears off.
- If an IV was placed for sedation, it will be taken out by a nurse in the recovery area once your child wakes up from the medication.

A Parent’s/Guardian’s Role During the Scan

We welcome your help and support during this scan. One parent or guardian is invited to join your child in the exam room and scan room. Other adults and children must stay in the waiting area. If your child will be having sedation, you will be asked as the parent or legal guardian to sign a consent form before the sedation is given.

- The most important role of a parent or guardian during the scan is to help your child stay calm and relaxed. It is important that your child stays still during the MRA.
- The best way to help your child stay calm is for you to stay calm.
- We encourage you to talk to your child during the scan to offer reassurance.
- You may bring along a “comfort” item—such as a favorite stuffed animal or “blankie”—for your child to hold during the test.
- Please follow the instructions of the nurse or technologist. They will show you where to sit or stand during the scan.
- If your child starts to move or wakes up during the scan, please tell the medical staff by using the intercom system.



- If an IV must be placed, you can help by reassuring and calming your child. Please tell the staff of ways that they might also help in keeping your child calm.
- Please do not distract the medical team or interrupt the scan in any way.
- We welcome your questions, but please ask them either before or after the scan.
- If your child is given sedation, please gather all of your belongings after the scan is finished so your child can be taken immediately to the recovery area.

Waking Up/Going Home After Sedation

- If your child received sedation for the scan, he or she will be moved to the recovery area after the scan and will stay there until the medication wears off. The length of time it takes the medication to wear off will vary, as some children take longer than others to become alert. The minimum amount of time spent in recovery is 1 hour.
- Your child will not be discharged until he or she is able to eat and drink. A nurse in the recovery area will give your child juice and crackers.
- When your child is discharged, he or she may still be groggy and should take it easy for the rest of the day.
- Your child may resume normal eating and drinking when you get home.
- Your child may resume normal activities the next day.

After the Test

A pediatric neuroradiology doctor will look at and interpret the MRA scan, and a report of your child’s scan will be sent to the doctor who ordered it, usually within 48 hours. If the results are urgent, the referring doctor will be contacted immediately.

- Please contact the doctor who ordered the scans for the results.
- If your child did not receive sedation, then no special follow-up care for your child is necessary.

Special Needs

If your child has any special needs or health issues you feel the doctor performing the scan needs to know about, please call the Department of Pediatric Neurology at Children’s Hospital of Pittsburgh **before the scan** and ask to speak with a nurse. It is important to notify us in advance about any special needs.

Division of Pediatric Neurology
Children’s Hospital of Pittsburgh of UPMC
One Children’s Hospital Drive
4401 Penn Ave.
Pittsburgh, PA 15224
(412) 692-5520

To see the list of all available patient procedures descriptions, please visit www.chp.edu/procedures.