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Magnetic Resonance Imaging (MRI)

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What It Is

Magnetic resonance imaging (MRI) is a safe and painless test that uses a magnetic field and radio waves to produce detailed pictures of the body's organs and structures. MRI does not use radiation, which is one of the ways it is different from a CT scan. The MRI scanner consists of a large donut-shaped magnet with a deep tunnel in the center. Patients are placed on a table that slides into the tunnel.

During the examination, radio waves manipulate the magnetic position of the atoms of the body, which are picked up by a powerful antenna and sent to a computer. The computer performs millions of calculations, resulting in clear, cross-sectional black and white images of the body. These images can be reconstructed into three-dimensional (3-D) pictures, which show remarkable representations of the scanned area. This helps to pinpoint problems in the body.

Why It's Done

MRI is used to detect a variety of conditions, including problems of the brain, spinal cord, skeleton, chest, lungs, abdomen, pelvis, wrist, hand, ankle, and foot. In some cases, it can provide clear images of body parts that can't be seen as well with an X-ray, CT scan, or ultrasound, making it particularly valuable for diagnosing problems with the eye, ear, heart, and circulatory

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system.

An MRI's ability to highlight contrasts in soft tissue makes it useful in deciphering problems with joints, cartilage, ligaments, and tendons. MRI can also be used to identify infections and inflammatory conditions or to rule out certain other problems such as tumors.

Preparation

In many cases, undergoing an MRI requires no special preparation. However, metallic objects often produce a bright or blank spot on the diagnostic film. The technician will have your child remove any other metallic object, such as eyeglasses, jewelry, or a belt. Electronic devices are not permitted in the MRI room. Braces and dental fillings will not interfere with the scan. You will also be asked questions to make sure your child does not have any internal metal clips from previous surgery or anything else that might cause a problem near a strong magnetic field.

To obtain the highest quality MRI results, your child will need to be completely still during the scan. For this reason, sedation may be required during the MRI. This is common in infants and young children. If sedation is needed, food and liquids will be stopped at a certain point before the MRI to allow your child's stomach to empty. It is important to notify the MRI technician of any illness, allergy, or previous drug reactions.

You can stay in the MRI room with your child until the test begins, then you'll join the technician in an outer room or be asked to sit in the waiting room. If you're nearby you'll be able to watch through a large window and talk to your child through an intercom during breaks between the scans.

Procedure

An MRI exam usually takes 20 to 90 minutes to perform, depending on the type of study being performed. Your child will lie on the movable scanning table while the technologist places him or her into position. The table will slide into the tunnel and the technician will take images. Each scan will last a few minutes.

To detect some problems, your child may be given a contrast solution through an IV. The solution, which is painless as it goes into the vein, highlights certain areas of the body, such as blood vessels, so doctors can see more detail in specific areas. Contrast solutions are safe, with very low incidence of allergic reactions.

As the exam proceeds, your child will hear repetitive sounds from the machine, which are normal. Headphones to listen to music or earplugs to quell the noise may be provided. Your child will have access to a call button in case he or she becomes uneasy during the test. If sedated or given anesthesia, your child will be monitored at all times.

Once the exam is over, the technician will help your child off the table, unless sedation is involved, in which case your child may be moved to a recovery area.

What to Expect

MRIs are safe and painless. Your child may have to lie still on the MRI table for 30 to 90 minutes during the procedure, but there are brief breaks between each scan. Unless sedation is used or you are told otherwise, your child can immediately return to normal routines and diet. Most sedation will wear off within an hour or two, and any contrast material given should pass through the body in about 24 hours.

Getting the Results

The MRI images will be looked at by a radiologist, who is specially trained in reading and interpreting the scans. The radiologist will send a report to your doctor, who will discuss the results with you and explain what they mean. In most cases, results cannot be given directly to the patient or family at the time of the test.

Risks

MRIs are safe and easy. No health risks have been associated with the magnetic field or radio waves, since the low-energy radio waves use no radiation. The procedure can be repeated with no adverse side effects.

Helping Your Child

You can help your child prepare for an MRI by explaining the test in simple terms before the examination. Make sure you explain what part of the body will be examined and that there are likely to be snapping and cracking noises as the MRI scans are taken.

It may also help to remind your child that you'll be nearby and able to see through the window and hear through the intercom. If an injection of contrast fluid is required, you can tell your child that the initial sting of the needle will be brief and that the test itself is painless.

If your child will be awake for the test, be sure to explain the importance of lying still. Your doctor may suggest that you and your child take a tour of the MRI room before the test.

If You Have Questions

If you have questions about the MRI procedure, speak with your doctor. You can also talk to the MRI technician before the exam.

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