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Magnetic Resonance Imaging (MRI)

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Listen to the Cancer.Net Podcast: MRI?€"What to Expect [1], adapted from this content

Key Messages:

- Magnetic resonance imaging (MRI) is a test that uses magnetic fields, not x-rays, to produce detailed images of the body, helping a doctor find, evaluate, or monitor a cancer.
- During an MRI, a special dye may be used to help create a clearer picture.
- While lying on a movable exam table, you will slide through a hole in the center of the MRI machine and remain still until the scan is over.

An MRI is an imaging test that uses powerful magnets and radio waves to produce detailed, computer-generated pictures of organs and tissue inside the body, including the brain and spinal column. An MRI can be used to:

- Find a tumor
- Determine, in some situations, if a tumor is benign (noncancerous) or malignant (cancerous)
- Learn more about the stage of cancer (the size and location of the tumor)
- Help doctors plan cancer treatments, such as surgery or radiation therapy
- Monitor a tumor?s response to treatment

Because it does not use x-rays or other forms of radiation, an MRI is often used to look for problems in the female and male reproductive systems. In addition, it is often used to look for and evaluate tumors in the chest and abdomen, including in the breast. Learn more about breast MRI [2].

The medical team

An MRI is done at the radiology department of a hospital or at an outpatient imaging center. It is performed by a radiologist (a medical doctor who performs and interprets imaging tests to diagnose disease) or a radiology technologist (a health care professional who is specially trained and certified to perform an MRI but not to interpret the results).

Preparing for the test

When you schedule your MRI, you will get detailed instructions about how to prepare. You may need to avoid eating for two or more hours before the test, but usually you will not need to make any special preparations.

Tell your doctor about all medications you are taking, as well as any drug allergies or any other medical conditions you may have. Women should tell their doctors if there is any chance that they may be pregnant. In addition, it is important to tell your doctor and the technologist performing the MRI about any metal implants or metal fragments you have in your body. These can cause serious, and even fatal, complications when exposed to the strong magnetic pull generated by the MRI. People with pacemakers, for example, cannot have an MRI.

Before your appointment, you may want to check with your insurance provider to find out whether the cost of the MRI will be covered and if there are any additional costs you may need to pay yourself. Once you arrive for your scan, you will be asked to sign a consent form that states you understand the benefits and risks of the MRI and agree to have the test done. Talk with your doctor about any concerns you have about the MRI. Also, consider asking whether you can bring music with you to the scan; some facilities allow patients to listen to music through headphones during their MRI.

During the test

When you arrive for your MRI, you will need to remove any jewelry or other metal objects you are wearing. You may also need to change into a hospital gown.

Depending on the part of your body that will be scanned, you may be given a contrast medium (a special dye) through an intravenous (IV) line or orally (by mouth). If the dye is given through an IV, a nurse or doctor will insert a small needle into a vein in your arm or hand, and a saline solution (a mixture of salt and water) will flow through the line until the dye is injected at a specific point during the test. The dye will travel through the bloodstream and help create a clearer picture of specific parts of your body.

A technologist will help position you on a moveable exam table outside of the MRI machine. You will lie on your back with your arms at your side and your head on a headrest. A ?coil? will be positioned over or around the part of your body that will be studied to create a clear picture of that area.

When you are in the correct position, the exam table will slide through the hole in the center of the MRI machine, which looks like a large donut. The standard MRI machine has a narrow, tunnel-like opening. Some facilities have less confining or ?open? MRI machines.

You will need to lie still as the machine takes a series of pictures. Each series will take up to 15 minutes, and you may need to have two to six series before the test is over. An MRI will usually last up to 90 minutes. The technologist should be able to give you a time estimate before you begin.

During the scan, the technologist will be in a nearby computer room, separated by a window. The technologist will be able to see you, and you will be able to communicate at all times through an intercom system. The part of your body that is being examined may feel warm during the MRI; this is normal.

You will know when the machine is taking pictures because you will hear loud tapping or knocking sounds. Once the MRI is complete, you may be asked to stay on the exam table while a radiologist reviews the pictures to see if more are needed.

An MRI is not painful. However, if you receive an IV, you may feel discomfort when the needle is inserted, and

the saline solution in the IV may cause a cool feeling at the injection site. In addition, you will need to lie still for most of the scan, which could become uncomfortable. The loud sounds coming from the machine may also make you uncomfortable, and you may be given earplugs to wear during the scan. If you are claustrophobic (afraid of small spaces), tell the technologist before beginning the examination. The radiologist may be able to give you a medication to help you relax (sedative).

After the test

You can go back to your usual activities immediately after your MRI, including driving, unless you were given a sedative.

Questions to ask your doctor

Before having an MRI, consider asking the following questions:

- Who will perform the MRI?
- What will happen during the MRI?
- How long will the procedure take?
- Can a friend or family member sit in the MRI room during my examination?
- What are the risks and benefits of having an MRI?
- How accurate is an MRI at finding cancer?
- Is the imaging facility accredited by the American College of Radiology [3] to perform MRIs?
- When will I learn the results? How will they be communicated to me?
- Who will explain the results to me?
- What other tests will I need if the MRI finds evidence of cancer?

More Information

Computed Tomography (CT) Scan [4]

Positron Emission Tomography (PET) Scan [5]

Integrated PET-CT Scan [6]

Additional Resources

RadiologyInfo: Magnetic Resonance Imaging [7]

MedlinePlus Interactive Tutorial: Magnetic Resonance Imaging Scan (MRI) [8].

Links:
[1] http://www.cancer.net/sites/cancer.net/files/MRI_What_to_Expect.mp3
[2] http://www.cancer.net/node/24415
[3] http://www.acr.org/
[4] http://www.cancer.net/node/24486
[5] http://www.cancer.net/node/24648
[6] http://www.cancer.net/node/24565
[7] http://www.radiologyinfo.org/en/info.cfm?pg=bodymr
[8] http://www.nlm.nih.gov/medlineplus/tutorials/mri/htm/index.htm