

Magnetic Resonance Imaging (MRI) – Breast

What is Magnetic Resonance Imaging (MRI) of the Breast?

Definition

Magnetic Resonance Imaging (an MRI) of the breast creates images of the tissues and structures inside the breast(s) in order to evaluate their condition and to assist with the diagnosis and treatment of problems. In some ways, an MRI is similar to an x-ray, but it is also different in several important ways.

How It Works

During an MRI procedure on the breast(s), a contrast material (dye) is injected into the patient's body via an IV (intravenous drip) (unless the sole purpose of the MRI is to determine if a breast implant has ruptured, in which case the injection of contrast material is not necessary). The contrast material contains a magnetic substance called gadolinium. When the MRI equipment is put in motion, the contrast material reacts to the magnets to reveal the details of the structures within and around the breast(s), similar to the way x-rays create images of bones. The difference is an MRI uses a powerful magnetic field and radiofrequency pulses to create detailed pictures, whereas an x-ray uses radiation. X-rays are usually less effective for creating images of soft organs and tissues in the body because this soft matter shows up as shades of grey, unlike bones which are bright white and can be seen in detail. An MRI of the breast(s) gives doctors additional information to what can be obtained through a mammogram or ultrasound of the breast(s); however, an MRI of the breast(s) is meant as a supplement to and not a simple substitute or replacement for those important procedures.

Common Uses

MRIs of the breast(s) are commonly used for:

- Determining if silicone breast implants are leaking or ruptured; it is the best method for evaluating these issues.
- Screening women at especially high risk for breast cancer, beyond and in addition to what can be determined from a routine mammogram.
- Getting a second, perhaps more detailed, look at abnormalities noticed during a routine mammogram.
- Evaluating the amount and location of cancer cells present, after a new diagnosis of breast cancer.
- Monitoring the sites of lumpectomy procedures after the treatment of the cancer (to make sure any changes are due only to the scarring process and not to a recurrence of the cancer).
- Guiding the course of neoadjuvant chemotherapy (where both chemotherapy and then lumpectomy are to be performed), in that MRIs of the breast(s) allow doctors to see if/how well the chemotherapy is progressing and to see how much of the tumor is left before the lumpectomy procedure is to be carried out.

Benefits and Risks

Benefits

- Magnetic resonance imaging (MRIs) can help identify causes of pain, lumps, or abnormalities picked up on a routine mammogram and can help the patient make informed decisions about further treatment.
- Magnetic resonance imaging (MRIs) can, in some cases, produce higher quality images of the breast(s)'s internal structures than other methods, which can make a crucial difference in a doctor's ability to quickly and accurately evaluate the (potential) presence of cancer and its spread.
- Magnetic resonance imaging is a non-invasive procedure.
- The patient is not exposed to any radiation during an MRI procedure.
- The contrast material (dye) used in MRIs is less likely to cause allergic reactions than those used for x-rays and CT scans.

Risks

- There is an extremely small risk of developing an infection (less than 1 in 1,000) at the site where the patient's skin is punctured to establish the intravenous drip (IV), which would require treatment with antibiotics if it were to arise.
- Although rare, few patients may experience side effects from the contrast material. Patients are instructed to notify the technician immediately if any side effects are noted during the procedure.
- Medical devices inside the body may cause problems during any MRI exam because they will be affected by the magnets in the MRI equipment. Therefore, patients are carefully screened to insure it is safe to have an MRI scan.
- In extremely rare cases, patients with compromised kidney function who are injected with high doses of gadolinium contrast material (magnetic dye) during an MRI can develop nephrogenic systemic fibrosis.
- Other potential risks may vary from patient to patient; the patient should speak to his or her doctor before the procedure about any questions or concerns.

How Should I Prepare for My Appointment?

Restrictions on what a patient may eat or drink before an MRI procedure vary, based on the type of procedure to be performed and the facility's guidelines. In certain cases, the patient may be asked to fast (to avoid consuming any food or liquids aside from water) for 8-12 hours before the procedure. The patient should check with the facility to see if he/she can eat, drink, and take medication as usual before the procedure. The patient should notify his or her doctor of any drugs or materials to which he/she is allergic and should notify doctor of pregnancy or of any other pertinent details of his or her medical history (prescriptions, recent illnesses or injuries, or serious health problems, etc.).

What Will Happen During the Procedure?

- The patient will be asked to remove any items of clothing, jewelry, or other accessories that might interfere with the procedure.
- A patient gown will be provided.
- Because the scan is loud, hearing protection will be provided.
- The technician will insert a needle into a vein to establish an IV (a harmless saline solution would most likely be dripping from the IV bag until it is time to insert the contrast dye via the

IV) – unless the procedure is being performed only to determine if a breast implant has ruptured, in which case the IV and contrast dye are not necessary.

- The patient will be asked to lie face down on the moveable examination table, where there are openings in the surface to allow the breasts to descend naturally and rest, uncompressed. Then, the examination table will be slid into position inside the cylindrical tube.
- The patient will need to remain very still while the MRI machine takes images of the breast(s).
- The patient will be alone in the exam room (a parent or friend may be allowed to stay in the room), but the technician will be able to see and speak with the patient through a two-way intercom. The MRI machine will be noisy (it “buzzes” and “hums” while the magnets do the scanning).
- After all the necessary images have been collected (sometimes several “runs” are necessary to obtain enough images of the body part or area in question), the exam table will be moved back out of the cylindrical tube and the patient may get up.
- If an IV was inserted, it would be removed after the procedure is complete.

What Should I Expect After the Procedure?

If the patient has been sedated as part of the MRI procedure, a short recovery period may be required; otherwise, the patient may generally go on with his or her normal routine and activities. There is conflicting research about whether or not breastfeeding mothers should continue nursing immediately after being injected with the contrast dye through an IV; the manufacturers of the contrast dye recommend mothers abstain from breastfeeding for 24 to 48 hours after the procedure (using a breast pump to store extra milk ahead of time and expressing and discarding their milk during that 24-48 hour time period).