

Breast MRI

Consumer Information

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What is a Breast MRI?

A Breast MRI is a medical test where magnetic fields, radiowaves and an advanced computer are used to produce very detailed images of the breasts without using X-rays.

The MRI (**magnetic resonance imaging**) machine is a large cylinder-shaped tube surrounded by a circular magnet. You will lie on a sliding examination table that is moved into the centre of the machine.

Frequently, a liquid contrast material or agent (**gadolinium DTPA**) is injected into a vein into the back of the hand or arm. This is because abnormal tissue within the breast tends to attract the contrast material and becomes more easily detected on the pictures or images taken by the MRI machine. The liquid contrast agent is not radioactive. Breast MRI is usually performed for one of 3 reasons:

1. To identify early breast cancer in women with a high risk of breast cancer, e.g. a past history of breast cancer in a young woman, a strong family history of breast cancer, or known genetic mutation (a hereditary characteristic that predisposes a woman to breast cancer).
2. To determine the extent of breast cancer that has already been diagnosed on mammography or ultrasound followed by a biopsy (the removal of a sample of tissue for testing).
3. Least often it is performed to determine whether an artificial breast implant in one or both breasts is intact.

How do I prepare for a Breast MRI?

When you make your Breast MRI appointment you may be asked the date of the first day that bleeding started for your last menstrual period. Your appointment will be made for a date between 6 and 16 days after the start of your last period. This is the best time for Breast MRI to detect any abnormality that may be present because there is minimal interference from the normal hormone-related changes that occur in breast tissue.

If you are on hormone replacement therapy (HRT) you will need to stop taking it from 4 to 6 weeks before the scan. Your doctor will advise about this.

If necessary, Breast MRI may be performed if you are a breastfeeding mother. The take up of one of

the gadolinium contrast agents into breast milk has been shown to be minimal (0.01%) and very little (less than 1%) of the drug is absorbed by the baby when taken in this way. This is a very tiny proportion of the dose that would normally be given to a baby who was having MRI itself.

Therefore, you do not need to stop breastfeeding.

There is no special preparation needed prior to MRI. You will be able to take your normal medications, except hormone replacement therapy. Fasting (going without food or drink) is not necessary.

If you have a condition that makes it difficult for you to lie still in an enclosed area (claustrophobia) or if lying on your stomach with your arms stretched out above your head for 30 to 60 minutes without moving is difficult, tell your doctor and the staff where you are having the MRI at the time you are making your booking. You may be prescribed a small dose of a relaxant medication by injection or tablet to help you to relax.

Please bring your previous mammograms, breast ultrasounds, and reports of any biopsy results with you when you come for your MRI test. These are very useful to the doctor who reads your MRI as they often provide further information that helps when interpreting the findings.

Please report to the reception desk in the hospital MRI department or private radiology practice for your procedure AT LEAST 30 minutes before your appointment time. Before your breast MRI, the procedure will be explained to you and you will be asked to complete a safety questionnaire. You will have the opportunity to ask questions.

You will be given a gown to wear and somewhere to place your belongings. You will need to take off your jewellery, bra and any other clothing items that contain metal, such as zippers or metal buttons. Do not take any watches or any card with a magnetic strip (such as a credit card) into the MRI machine, as they may not work once exposed to the magnetic field.

In some cases you may not be able to have the MRI test done, for example if you have a pacemaker, artificial limb, any metal pins or metal fragments in your body (especially in the eyes), metal heart valves, metal clips in your brain, metal implants in your ear, tattooed eyeliner or metallic-based tattoos, or any other implanted or artificial medical device (such as a medication infusion pump). You should also inform your doctor if you have worked around metal or if you have recently had surgery on a blood vessel.

Other reasons why you may not be able to have this test include:

- If you have a known allergy to the contrast agent used for MRI.
- If you have other health conditions, such as serious kidney problems or sickle cell anaemia.

- If you are pregnant. The effects of MRI on the developing baby are not fully known and the contrast agent is known to cross the placenta (that is, reach the unborn baby). We do not know of any harmful effects so far but at present we do not perform Breast MRI during pregnancy unless the potential benefits are thought likely to outweigh these small but as yet unproven risks to the foetus (unborn baby).

What happens during a Breast MRI?

Breast MRI is a painless procedure, usually done on an outpatient basis.

If an injection of contrast is required, an intravenous line (IV) (a thin plastic tube) will be placed in a vein (usually on the back of your hand or arm) by a nurse before you go into the scan room. This IV line will be removed at the end of your procedure.

You will be asked to lie on your stomach on a movable padded table with your arms above your head. Your breasts will be placed into the breast coil, which is like a special padded bra. This coil works with the MRI machine to create the images of your breasts. Mild compression (slight pressure) is put on your breasts just to keep them from moving otherwise the images may be blurry. This is far less than the compression you will have experienced with a mammogram and is not painful. Your breasts will be completely covered during the entire examination.

Once you are comfortably positioned, the table is moved into a short tunnel within the MRI scanner.

The inside of the scanner is well-lit, and has a fan to blow fresh air gently over you. The machine makes loud thumping and knocking noises while it is working, which is quite normal. You will be given special head phones or ear plugs to help block out this noise. The technologist will be able to hear you and will talk to you during the examination through the ear phones. It is very important that you do not move during the examination, as this will make the images blurry. If you become very uncomfortable whilst in the MRI machine, you will be able to communicate with the technologist by speaking or using a special buzzer that you can hold in your hand. The technologist can hear and see you at all times.

There are several steps involved in obtaining the images during the procedure, which the technologist will explain to you. During the intravenous injection you will feel a cold sensation at the place where the IV line is situated in your hand or arm. This is normal and will only last a few seconds.

The time you will spend on the table is 30 – 60 minutes and the total examination (from the time you are called from the waiting area) is usually completed within an hour and a half.

After the technologist has completed the test, the table you are lying on will be moved out from inside the machine and the IV line removed. Pressure will be applied to the site or area where the needle was inserted followed by a small adhesive dressing.

You may eat and drink normally and providing you have not had any sedative medicine before the scan, you may drive and return to work. If you have had sedation, you will need to wait in the MRI facility for 30 minutes after the examination and you should not drive for 6 hours because the sedation may affect your reaction time to a mild degree. You will be able to walk and talk normally and dress yourself to leave.

A report on the scans will be sent to your referring doctor. This report usually takes several days to prepare.

If you have any concerns or queries please do not hesitate to contact the hospital department, your breast care nurse or the radiology practice where you received the test.

Are there any after effects of a Breast MRI?

If you have not been sedated, no recovery period is necessary. You may resume your usual activities and normal diet immediately after the examination.

A few patients (1 in every 100) experience side effects from the contrast material, including nausea and local pain. Uncommonly, patients are allergic to the contrast material and experience hives and itchy eyes. This is usually easily treated with antihistamine medication given intravenously, that is, by injection. More serious reactions to the contrast are rare, occurring in about 1 in 10,000 patients and include difficulty breathing and very low blood pressure. If this happens, intravenous drugs are given by the medical staff at the MRI facility, followed by admittance to hospital for a short period for observation. People who know they have asthma or allergies to any food or drugs have a higher chance of this serious type of adverse reaction, but this increase in risk is quite small. In addition, most people who have a serious reaction have no history of asthma or any kind of allergy, so this rare side effect is not predictable by the technologist or your doctor.

A very rare but serious complication from the contrast injection called nephrogenic systemic sclerosis has been recorded in patients who have poor kidney function. Patients with this complication may develop thickening of the skin and soft tissues, mainly affecting arms and legs and more rarely damage to the heart and kidneys. This complication has only been recorded in patients whose kidney function is weakened. The MRI facility you attend will make an assessment about whether you need to have your kidney function checked before you have a gadolinium contrast material injection by asking questions about your medical history. In general, younger, healthy people with no known history of kidney disease will not need their kidney function tested.

You may have a bruise at the site where the IV line was inserted. There is also a very small chance of irritation or infection of your skin at the site of the IV tube insertion due to leakage of the gadolinium contrast material. This may require treatment with local anaesthetic and an ice pack and if the leakage was large, you may be asked to attend your own

doctor or the MRI facility the next day to ensure that the irritation is settling. Very rarely, this type of leakage can lead to a clot formation in the affected vein, which can break off and spread to the lungs. This is the reason the follow up is necessary if you experience contrast leakage around your intravenous line.

If you are breastfeeding it is quite safe to continue this after the examination as studies have shown that only a very tiny amount of the contrast material is absorbed by the baby from the milk.

If you have had any sedation for the procedure, you will need to stay in the MRI facility for a while after your scan. We recommend that you avoid driving a car or operating machinery for at least 6 hours and we suggest you make arrangements for a relative or friend to take you home.

How long does a Breast MRI take?

The procedure can take between 45 minutes to one and a half hours, including the time to prepare you for the scans and obtaining the images.

During the procedure, a large amount of information is obtained and many images are produced. The MRI technologist will need to check that the images are satisfactory before finishing the examination.

You will need to remain in the MRI facility for a short period of observation before being allowed to go home, especially if you have had relaxant medication to help you to stay still during the test.

What are the risks of a Breast MRI?

The MRI examination poses almost no risk to the average patient when appropriate safety guidelines are followed.

If your doctor has prescribed sedative medication for you, you may feel drowsy and you will not be allowed to drive a car until the effects have worn off.

Although the strong magnetic field is not harmful in itself, medical devices that contain metal may malfunction or cause problems during an MRI examination, which is why we ask you questions about whether you have these devices as part of the safety questionnaire before the test is performed.

There is a very slight risk of an allergic reaction if contrast material is injected. Such reactions are usually mild and easily controlled by medication. Approximately one in 100 patients experience nausea and flushing (reddening of the skin) during or shortly after the injection.

One in 10,000 patients will have a more severe allergic reaction (difficulty breathing, drop in blood pressure) which may require emergency treatment. A very small number of patients have died from this.

There is a very small risk of skin infection at the site of the injection.

Nephrogenic systemic fibrosis is currently a recognized, but rare, complication of MRI believed to be caused by the injection of certain (but not all) MRI contrast material in patients with poor kidney function. It is important that you tell your doctor if

you have any history of kidney problems. You may be asked to have a blood test to check your kidney function before the scan.

What are the benefits of a Breast MRI?

Breast MRI is usually performed in addition to, rather than instead of, mammograms and breast ultrasound. Some of the benefits and advantages of Breast MRI include:

- MRI does not involve exposure to radiation. It can therefore be safely used to screen women at increased risk of breast cancer who need to have breast screening when they are younger than 40 years of age (when breast tissue is much more sensitive to the effects of radiation).
- MRI is the most sensitive test to detect early breast cancer in particular groups of women at high risk. These include women with a known faulty gene that pre-disposes them to developing breast cancer (BRCA 1 or 2 mutation), women with a strong family history of breast cancer (where several family members have been affected e.g. sisters, mother, at a young age), and women who have had previous chest radiation treatment for Hodgkin's disease or other cancer before the age of 30.
- The ability of MRI to show abnormalities is not lessened by dense breast tissue (which is common in younger women). Mammography is much less effective in this situation.
- Breast implants can obscure breast tissue during mammography. MRI is the best method to evaluate the breasts of women with implants as it has the ability to show the tissues around the implants in cross-section.
- MRI is able to show whether a breast implant has ruptured, where mammography and ultrasound are less accurate.
- As a problem-solving tool in cases where conventional tests such as mammography and ultrasound show uncertain findings, a normal MRI study is generally able to exclude most types of breast cancer.
- Pre-operative staging: MRI is the most accurate way of determining the size of a cancer and whether there are other tumours (cancers) present in the same or other breast. This information may affect the type of surgery needed. This can prevent unnecessary removal of the whole breast (where there is only one small tumour) or under-treatment where only part of the breast is removed (and this does not remove other tumours that mammography and ultrasound may not have shown).
- Evaluation of the response of a cancer to drug treatment: MRI performed halfway into a course of drug therapy can help determine if the drugs are effective.
- Assessing residual disease after surgery and checking to see if the tumour has come back in the breast. MRI is better able to show

suspicious findings amongst scar tissue than mammography.

Who does the Breast MRI?

Your breast MRI will be performed by a [medical imaging technologist](#) who is skilled at operating the MRI machine and in positioning you for the test.

The technologist prepares the images that are obtained during your MRI examination for viewing by a [radiologist](#) (specialist doctor) who will interpret the MRI images and prepare a written report for your referring doctor.

Where is a Breast MRI done?

This outpatient procedure may be performed within a public or private hospital radiology department, or at a private radiology practice. This test may not be offered by all locations even when they have an MRI machine on site.

When can I expect the results of my Breast MRI?

The time that it takes your doctor to receive a written report on the test or procedure you have had will vary, depending on:

- the urgency with which the result is needed
- the complexity of the examination
- whether more information is needed from your doctor before the examination can be interpreted by the radiologist
- whether you have had previous x-rays or other medical imaging that needs to be compared with this new test or procedure (this is commonly the case if you have a disease or condition that is being followed to assess your progress)
- how the report is conveyed from the practice or hospital to your doctor (in other words, email, fax or mail)

Please feel free to ask the private practice, clinic, or hospital where you are having your test or procedure when your doctor is likely to have the written report.

It is important that you discuss the results with the doctor who referred you, either in person or on the telephone, so that they can explain what the results mean for you.

Further information about Breast MRI:

Not all things that show up on a Breast MRI will be due to cancer. Breast MRI is a very sensitive test, which means that it is very good at showing small and subtle or slight findings in the breast, many of which will not be due to cancer. This may mean that

you will need to have other tests done after your MRI to work out what these findings mean. This may include ultrasound scans and a breast biopsy (the removal of a sample of tissue for testing). The biopsy can usually be done with a needle but occasionally an operation (surgical biopsy) may be necessary. If you are having a surgical biopsy, a small marker will be put into the breast so that the correct area of concern can be removed and given to the pathologist for testing.

Occasionally, the images from a Breast MRI are unsatisfactory because there can be such a strong take up of contrast material by the normal breast tissue that it is impossible to detect any areas of abnormality (or show up anything unusual). The possibility of this happening is reduced by ensuring that the study is performed during the second week of your menstrual cycle if possible, and by stopping HRT for 4-6 weeks before your examination.

Useful websites about Breast MRI:

- This website is a radiology information source for patients published by the Radiological Society of North America.
<http://www.radiologyinfo.org/>
- This website gives more information regarding who is eligible for the Medicare benefit for Breast MRI.
<http://www.health.gov.au/internet/main/publishing.nsf/Content/mri-breast-qa>
- The National Breast and Ovarian Cancer Centre also has an on-line calculator which you can use to help work out your risk of developing breast cancer.
<http://www.nbcc.org.au/risk/yourrisk.html>

Please note:

This information is of a general nature only and is not intended as a substitute for medical advice. It is designed to support, not replace, the relationship that exists between a patient and his/her doctor. It is recommended that any specific questions regarding your procedure be discussed with your family doctor or medical specialist

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