

## MRI Heart (Cardiac MRI) - Cardiac Viability (perfusion and delayed imaging)

### Consumer Information

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### What is a Cardiac Viability MRI Scan?

Magnetic resonance imaging (MRI) uses a high strength magnet and radiowaves to scan the body and produce pictures or images. MRI does not use ionising radiation, which is required for many other types of imaging, and is not known to have any long term harmful effects.

Most people are suited to this examination, although there are some restrictions due to the strength of the magnet and its possible effects on devices or implants such as pacemakers.

An MRI Heart (Cardiac MRI) - Cardiac Viability (perfusion and delayed imaging), or Cardiac Viability MRI Scan, involves the injection of a special dye (often called contrast medium or contrast agent) into the veins during the scan. The contrast highlights the heart muscle in areas receiving a good blood supply. Areas receiving relatively less blood do not highlight on the images as well with the contrast, which can be an indicator of ischaemic heart disease (undersupply of blood and oxygen to the heart).

After a short delay, a second scan is performed. In this part of the scan, the contrast then highlights the parts of the heart muscle that are scarred, usually from a previous heart attack. The image quality from the MRI machine is good enough to show how extensive and how thick the scar tissue is.

The study provides your doctor with information about how much of the heart is scarred. Significantly scarred muscle is termed "non-viable", meaning that it will not recover even if blood flow is restored. Heart tissue that is not scarred but potentially undersupplied with blood and oxygen is termed "viable". Surgical procedures can be targeted to the parts of the heart muscle most likely to benefit, avoiding unnecessary surgery to restore blood supply to parts of the heart that have been irreversibly damaged.

### How do I prepare for a Cardiac Viability MRI Scan?

No special preparation is required.

You will be asked to complete a questionnaire prior to the examination to ensure that it is safe for you

to enter the MRI machine and be exposed to the magnet.

If you have a history of kidney disease your doctor may wish to do a blood test before the scan, to ensure that the contrast medium (known as "gadolinium chelate") can be safely given, if required (see *Gadolinium Contrast Medium (MRI Contrast agents)*).

### What happens during a Cardiac Viability MRI Scan?

You can wear your normal clothing to the examination but may need to remove some clothing prior to the scan. This is to eliminate any metallic objects that may interfere with the magnets, and to allow easy access for leads that will be placed on your chest to monitor your heart beat. You will be offered a hospital gown.

You will be positioned on the scanner bed by a radiographer, who is specially trained to perform MRI scanning. Leads to monitor your heart beat will then be placed on your chest. Because a contrast (gadolinium chelate) injection is required for this type of scan, a small needle will be placed in a vein in your arm. A special set of detectors encased in plastic, which work in conjunction with the main magnet to receive the radiowave signal to produce the images, will be rested on your chest like a blanket.

Once ready, you will be placed inside the MRI machine, which is like going into a short tunnel. You will be aware of humming and knocking noises going on around you, which indicates that the scanner is running. It is normal to feel a little warm during the scan. You will be asked to hold your breath from time to time during the scan, to help produce the best images possible.

The MRI machine can be noisy, so you will be provided with headphones and you can listen to music (you are welcome to bring your own CD) and speak with the radiographer performing the scan. You will also be given a squeeze ball to hold in your hand during the scan. Squeezing the ball will make the radiographer aware that you wish to speak. A microphone is located within the MRI machine.

Once you are comfortable and positioned, the radiographer will return to the control console, leaving you in the MRI machine. From here the radiographer will control the scanner to instruct the machine which part of the body to examine, and which views to perform to best investigate your particular condition. You will be able to communicate with the radiographer at all times.

An injection of contrast will be given during the scan.

## Are there any after effects of a Cardiac Viability MRI Scan?

Usually there are no after effects. You will be free to continue the day you have planned once the scan is complete.

## How long does a Cardiac Viability MRI Scan?

The examination uses very different technology to a normal X-ray, and does take more time to perform. The scan usually takes about 30 to 45 minutes.

## What are the risks of a Cardiac Viability MRI Scan?

### MRI machine

Once you have completed the pre-scan questionnaire and have been assessed as safe to enter the MRI machine, there are no significant risks from the MRI machine itself (see [Magnetic Resonance Imaging \(MRI\)](#)).

Most people are suited to this examination, although there are some restrictions due to the strength of the magnet and its possible effects on devices or implants such as pacemakers.

### Contrast medium

There is a very small risk of allergic reaction related to the contrast medium (gadolinium chelate) injection.

Recently, a condition called nephrogenic systemic fibrosis (NSF) has been identified as a rare but significant side effect of contrast injection. This complication is more likely to occur in those people with very poor (severely decreased) kidney function, including people who are already on dialysis (a process that filters the blood of patients whose kidneys are not functioning properly using a kidney machine). This rare but serious reaction takes weeks to months to develop. For more information on NSF see the information item on [Gadolinium Contrast Medium \(MRI Contrast agents\)](#).

## What are the benefits of a Cardiac Viability MRI Scan?

MRI scans avoid the need for exposure to potentially harmful radiation (X-rays). This is of particular benefit for all patients who are assessed as able to have an MRI, especially young patients, and those who will require repeat scans through their life to monitor their condition.

The major benefit of the study is to demonstrate which regions of the heart have been injured, usually as a result of a heart attack, and the thickness of heart muscle involved. Based on this information decisions can be made as to the suitability for procedures such as bypass surgery, and the likely future benefits. The detailed images produced by this technique are essentially the best that can be achieved.

## Who does the Cardiac Viability MRI Scan?

The scan is performed by a [radiographer](#) specially trained in MRI scanning, under the supervision of a [radiologist](#) (a specialist doctor). A cardiologist (heart specialist) is also involved.

## Where is a Cardiac Viability MRI Scan done?

The examination is a highly specialised test, and is not available at all hospitals or radiology practices. Your doctor is likely to be able to refer you to the hospital or radiology practice nearest to you offering these scans.

## When can I expect the results of my Cardiac Viability MRI Scan?

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.

### 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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