MRI: Everything You Need To Know

Heart MRI Scanning allows us to capture high resolution images of the structure and function of your heart, along with whether there it has any scarring or inflammation. We can also look at how it performs under stress. Using this data wethen make a detailed personal analysis of the current condition of your heart.

Scans typically take around 40 minutes and are considered the gold standard when it comes to assessing a heart the structure and function of the heart. You can find out more about MRI Scans and related information by clicking either of the buttons below.

For Patients:

Introduction

There are many reasons why your doctor may refer you for a heart MRI scan. The pictures we take of the heart depend on what the problem we are looking for might be. Broadly speaking, most scans will look at the structure and function of the heart muscle and valves and whether the former has any inflammation or scarring. Sometimes we will also look at how the heart performs under stress. The information from this generates a personal report which your doctor can then use to help to tailor any treatment you might need.

What is MRI

MRI stands for magnetic resonance imaging. It is nobel prize winning technology that is used throughout medical practice to look at the various different parts of the human body. The technique uses a strong magnetic field (either 1.5 or 3 tesla) to allow us to take images of the organ in question (in this case, the heart). There are no known risks to doing this, although there are a few patients who cannot have MRI scans (for example if you have metal fragments in your eye). Patients with most metal implants (for example joint replacements, stents or some types of pacemaker), can be safely scanned however.

For many scans we use a contrast agent called gadolinium to give us more information on the heart muscle. This is injected into a vein during the scan. There is a very small risk of allergy to the contrast (as there is with any medication / contrast agent in medicine) and around 1 in 100 people feel briefly nauseous after the injection. In patients with very poor kidney function (<30%), there maybe a tiny risk of an unusual skin reaction to the contrast (nephrogenic systemic fibrosis), although recent data assessing the risk with the newer gadolinium contrast agents we use suggests that this may no longer be a problem.

Preparation Prior to your Scan

If you are having a non stress MRI, there is very little preparation needed. On the day of the scan, you will fill in a safety form with us to make sure you are safe to enter a magnetic field. Once that has been done, we will ask you to change into one of our gowns and then bring you through to the scanner. If contrast is needed for your scan, a cannula (intravenous line) will be placed into a vein prior to the scan starting. We will also put some stickers on your chest to allow us to watch your heart ECG trace.

If you are having a stress MRI **you will need to avoid all caffeine intake ideally for the 24 hours prior to the scan (at the very least for 12 hours).** The reason for this is that in order to stress the heart, you will have a 3-4 minute injection of a drug called adenosine. The drug mimics what happens to your body when you exercise and hence allows us to see how the heart performs under stress. Caffeine blocks the effect of the drug and so stops us from adequately stressing the heart.

The MRI Scanner and Claustrophobia

MRI scanners come in various sizes. The scan itself takes around 40 minutes to do and during that time, you will be inside the scanner. Around 1 in 10 patients have claustrophobia. In the past this was a major problem in MRI as the scanners were very small. All bar one of the scanners I use for MRI scans in both my Private and NHS practice are "wide bore" and most have far less depth than older models. This has made claustrophobia much less of a problem. For patients who are claustrophobic, there are other things we can do which make the scan a much more pleasant experience, for example scanning you lying on your front with your feet going into the scanner first is far less claustrophobic. As a result of this, it is now rare that a patient will not tolerate the scan (<1%). Please let our team or myself know if you are claustrophobic.

What Happens During and After the Scan?

During the scan, we take a number of picture of the heart. For many of these, we ask you to hold your breath while the picture is being taken. This helps improve the resolution of the images we obtain by keeping your heart still. Typically, the breath-holds are for periods of 5-10 seconds. When the pictures are being taken, the scanner makes some noise and so you will be given headphones to protect your ears and allow you to hear us talking to you.

The scan itself will take around 40 minutes in most cases. Once finished, you can go back to your changing room, get dressed and you will then be free to leave. A report of the scan will be sent to your doctor, usually on the same day, if not within one working day (if the report is needed urgently in a faster time frame than this, it can easily be arranged if you let us know).

What is a Heart Stress MRI Scan?

A stress heart MRI scan allows us to assess whether or not the blood supply to the heart muscle is normal under stress. An abnormal blood supply is usually the result of

narrowings in the coronary arteries, which supply the heart muscle with blood. This is the commonest type of heart problem encountered in western world medicine.

How can MRI be used to assess the blood supply to the heart?

Problems with the blood supply to the heart often manifest with symptoms when the heart is placed under stress – for example by exercise. In order to assess the blood supply to the heart, we need to mimic mild exercise to see how your heart performs under such conditions. This is achieved by administration of a medication (called adenosine) into a drip in the arm for 3-4 minutes. A contrast agent (called gadolinium) is then administered into the drip and the MRI scanner shows us where the contrast goes in the heart. If there is a problem with the blood supply, the amount of contrast entering that area will be reduced.

What side effects might I get from the Adenosine Stress?

During the 3-4 minute infusion, you may develop similar symptoms to those you might have when walking up a hill – facial flushing, shortness of breath, headache, chest tightness or nausea. The most common side effect is facial flushing. These symptoms are very brief and usually wear off within 1 minute of the infusion finishing.

What are the risks of Adenosine?

The main risk of having Adenosine is in patients with asthma. Adenosine can precipitate an asthma attack. If your asthma is mild (for example, it has not required hospital treatment in the past and your chest is not wheezy when we examine you prior to the MRI scan), it is very unlikely that this will happen. If you have more severe asthma, the physician will discuss this with you, but it is likely that we will not administer adenosine in case it causes an asthma attack. If we do not administer adenosine, other options will be discussed with you. The only other risk of adenosine is of it causing a slow heart rate. This is rare and when it happens, usually would last a few seconds, following which the medication wears off and the heart rate will return to normal.