University Hospitals of Morecambe Bay NHS Foundation Trust

Myocardial Perfusion Scan

Cardiology and Nuclear Medicine

Patient Information Leaflet

What is a myocardial perfusion scan?

A myocardial perfusion scan uses a small amount of a radioactive chemical to see how well blood flows to the myocardium (muscles of the heart). It is also known as a 'thallium' or 'MIBI' scan. Often this scan is performed after gentle stressing to see how the heart muscle responds to that stress.

What is the myocardium?

- The heart is mainly made of special muscle called the myocardium. The muscle pumps blood into arteries (blood vessels) which take the blood to every part of the body.
- Like any other muscle, the myocardium needs a good blood supply.
- When the blood supply to the heart is reduced it may ‘complain' with pain; this pain is called angina.
- The coronary arteries supply the heart with blood.
- The usual cause of angina is narrowing of one or more of your coronary arteries which is caused by plaque.
- Plaque is a waxy substance that builds up in the coronary arteries.

The coronary artery blood supply may be enough when you are resting. However, your heart muscle needs more blood and oxygen when it works harder. For example, when you walk fast or climb stairs, your heart rate increases to deliver the extra blood and oxygen.

If the extra blood that your heart needs during exertion cannot get past the narrowed arteries, the heart 'complains' with angina pain.

What is a myocardial perfusion scan used for?

Myocardial perfusion scans can be used to try to find the cause of unexplained chest pain, or chest pain brought on by exercise. This test may also be done to:

- Show blood flow patterns to the heart wall.
- To determine the significance of borderline narrowings in arteries.

How does a myocardial perfusion scan work?

A myocardial perfusion scan uses a special radioactive tracer or Isotope as it is also known.

The radioactive tracer travels through the bloodstream and into the heart muscle.

As the radioactive tracer moves through the heart muscle, areas that have good blood flow absorb the radioactive tracer well.

Areas that do not absorb radioactive tracer very well may have a poor blood supply due to narrowed coronary arteries, or may have been damaged by a heart attack. So, heart muscle tissue with a good blood flow will emit more gamma rays than areas with a poor blood flow or damaged tissue.

Gamma rays are similar to X-rays and are detected by a device called a gamma camera.

The gamma rays which are emitted from inside the body are detected by the camera and are converted into a picture showing differing intensities of radioactivity as different colours or shades of grey.

This creates a picture that shows which parts of the heart muscle have good blood flow and which parts do not.

What happens during a myocardial perfusion scan?

The test is carried out on two separate occasions at rest and then stressing (exercising the heart).

The Stress Scan

In a **Stress test** you are given an injection of a medication that makes your heart beat faster and stronger.

Some people find that this gives them a tingling feeling in the chest or palpitations (sensation that your heart is beating strongly). These sensations usually pass quickly after the test is over.

When the heart is beating at a certain rate the radionuclide chemical is injected, usually into the hand/forearm.

You will usually be monitored during the test with an ECG (heart trace). This means that several sticky pads, called electrodes, will be placed on your chest. The electrodes are connected to a machine which shows how your heart responds checking your heart rate, rhythm and blood pressure throughout the test.

You will be asked to eat something fatty before your scan which is performed in the afternoon after the stress part of the test is done. This can help to make the images clearer, by removing excess isotope through your liver and gallbladder, after eating something with a high fat content.

When it is time to do the scanning, you will lie on a couch while the gamma camera detects the gamma rays coming from your body.

The computer turns the information into a picture. You need to lie as still as possible whilst each picture is taken (so it is not blurred).

Actual scanning time for each heart scan varies from 12 - 16 minutes.

The Resting Scan

A Resting test is carried out and may take place either a couple of weeks before or after the Stress test scan.

For the Resting scan you will just receive an injection of the radionuclide chemical and then have the images taken.

There is no injection of a medication to make your heart beat faster. You will also be asked to eat something fatty before your scan which is performed in the afternoon.

What should I do to prepare for a myocardial perfusion scan?

As these tests involve a small amount of radiation, pregnant women should not have them.

Let your doctor know if you are, or think you could be, pregnant. You should also let your doctor know if you are breast-feeding.

Generally there is not much preparation needed before this test. However, you will be asked not to eat or drink anything before the exercise stress test. You will be asked to have nothing to eat or drink after midnight preceding the test day.

In some cases, you will be advised not to take your beta blocker medication two days before the exercise stress test scan.

What can I expect after a myocardial perfusion scan?

If you have contact with children or pregnant women, although the levels of radiation used in the scan are small, you are advised to avoid close proximity contact if at all possible for 24hours.

Are there any side-effects or complications from a myocardial perfusion scan?

Most people have a myocardial perfusion scan without any problems. It is possible, although rare, that the exercise or the medication that makes your heart beat faster could cause an arrhythmia (abnormal heart rhythm) or myocardial infarction (heart attack).

This is why you are attached to an ECG machine so we can observe your heart rate and rhythm.

The medication that makes your heart beat faster may occasionally make some people 'wheezy'. The risk of this happening is higher if you have asthma or other lung conditions.

The term 'radioactivity' may sound alarming. But, the radioactive chemicals used in radionuclide scans are very small and considered to be safe, and they leave the body quickly.

The dose of radiation that your body receives is very small. In many cases, the level of radiation involved is not much different to a series of a few normal X-rays.

However, as with any other types of radiation (such as X-ray), there is a small risk that the gamma rays may affect an unborn child. So, tell your doctor if you are pregnant or if you may be pregnant.

Rarely, some people have an allergic reaction to the injected chemical. Theoretically, it is possible to receive an overdose when the chemical is injected. This is very rare.

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Evidence

Details of the evidence used in writing this leaflet are available on request from: Patient Information Officer at 01524 512476.

Feedback

We appreciate and encourage feedback. If you need advice or are concerned about any aspect of care or treatment, please speak to a member of staff or contact PALS on 01539 795497.

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NHS Quit Squad - **0800 328 6297**

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