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Myocardial Perfusion Scan (Nuclear Stress Test)

How to prepare and what to expect

What is a stress myocardial perfusion scan?

Myocardial perfusion is an imaging test. It's also called a nuclear stress test. It is done to show how well blood flows through the heart muscle. It also shows how well the heart muscle is pumping. This test is commonly ordered to diagnose and monitor coronary artery disease by showing if blood vessels are clogged or blocked.

A myocardial perfusion scan uses a tiny amount of a radioactive substance, called a radioactive tracer. The tracer travels through the bloodstream and is absorbed by the healthy heart muscle. There are no side-effects with this injection. On the scan, the areas where tracer has been absorbed look different from the areas that do not absorb it. Areas that are damaged or don't have good blood flow do not absorb the tracer. The damaged areas may be called “cold spots” or “defects.”

A stress myocardial perfusion scan assesses blood flow to the heart muscle when it is stressed. The heart is usually “stressed” from exercise. But, if you are unable to exercise, the heart can be stressed by taking a certain medicine that increases your heart rate or dilates blood vessels as would occur during exercise.

After the radioactive tracer is injected, a special type of camera is used that can detect the radioactive energy from outside the body. The camera takes images of the heart during rest and again later at stress. The two sets of images are then compared.

What happens during a stress myocardial perfusion scan?

Generally, a stress myocardial perfusion scan follows this process:

1. You will be asked to remove any jewelry or other objects that may interfere with the procedure.
2. An intravenous (IV) line will be started in your hand or arm.
3. A tracer will be injected into the IV and you will wait for it to circulate for a minimum of 10-15 minutes.
4. You will then lie flat on a table while the images of your heart are taken. Your arms will be on a pillow above your head. You will need to lie very still while the images are being taken, as movement can affect the quality of the images.
5. A gamma camera will begin to take pictures of your heart. In this special kind of test called SPECT (single photon emission computed tomography), the scanner rotates around you as it takes pictures.
6. You will then be connected to an electrocardiogram (ECG) machine with leads that stick to your skin and a blood pressure cuff will be placed on your arm.

If exercising:

7. You will exercise on a treadmill. The intensity of the exercise will be gradually increased by increasing the speed and elevation of the treadmill.
8. Your heart rate and blood pressure will be monitored. Once you have reached your maximal exercise point (determined by the healthcare provider based on your heart rate and age), the radioactive tracer will be injected into your IV line.
9. After the tracer has been injected, you will continue to exercise until you request to stop.
10. You will then be placed into the heart camera so images can be taken.

If you're not exercising:

11. Instead, you will receive a medicine that will be injected into your IV.
12. Your heart rate and blood pressure will be monitored.
13. The tracer will be injected into your IV line.
14. You will need to wait an additional 15 minutes after receiving the medication.
15. You will then be placed into the heart camera so images can be taken.