

# Guide to Nuclear Stress Test

## What is a Nuclear Stress Test (Myocardial Perfusion Scan)?

A nuclear stress test, also called a myocardial perfusion scan, is a type of nuclear medicine procedure. This means that a tiny amount of a radioactive substance, called a radionuclide, is used to evaluate the heart's function and blood flow.

A nuclear stress test is used to identify and assess potential blockages inside the coronary arteries. The test shows the blood flow to the heart muscle when it is stressed by either exercise or a stress inducing medication and to determine what areas of the heart have decreased blood flow. This is done by reviewing images of the heart obtained after injecting a radionuclide (thallium or technetium) through an intravenous catheter into a vein in the arm or hand.

There are two types of nuclear stress tests, one that is used in conjunction with exercise (exercise stress test) and one that is used in conjunction with medication (pharmacologic stress test).

## Nuclear Stress Test With Exercise

A nuclear stress test with exercise is used to determine what areas of the heart muscle have decreased blood flow during exercise. This test is done by first injecting a radionuclide (thallium or technetium) through an intravenous catheter into a vein in the arm or hand while the patient is at rest. After the radionuclide has been injected and has circulated through the blood stream, a special machine called a gamma camera takes pictures of the heart while the person lies still on a table. This scanning usually lasts about 3-5 minutes. This is the rest scan of the heart.

Next, the exercise stress test is performed with the patient walking on a treadmill. At peak exercise, a second radionuclide dose is injected through the intravenous catheter. After the radionuclide has been injected and has circulated through the blood stream, a second scan of the heart is performed in the gamma camera. This scanning also lasts about 3-5 minutes. This is the stress scan of the heart.

Any areas of the heart that have blocked or partially blocked arteries will be seen on the scans as "cold spots," or "defects," because these areas will be unable to absorb the radionuclide into the heart.

## Pharmacological ("Chemical") Stress Test

A pharmacologic stress test is used when the physician has determined that exercise on a treadmill is not an appropriate choice due to the patient's medical or physical condition. In this situation, medications are given that either cause the coronary arteries to dilate or cause the heart rate to increase. This pharmacologic response is similar to the response caused by exercise.

This test is done by first injecting a radionuclide (technetium) through an intravenous

catheter into a vein in the arm or hand while the patient is at rest. After the radionuclide has been injected and has circulated through the blood stream, a special machine called a gamma camera takes pictures of the heart while the person lies still on a table. This scanning usually lasts about 3-5 minutes. This is the rest scan of the heart.

Next, the pharmacologic stress test is performed with the patient receiving the medication. At peak stress, a second radionuclide dose is injected through the intravenous catheter. After the radionuclide has been injected and has circulated through the blood stream, a second scan of the heart is performed in the gamma camera. This scanning also lasts about 3-5 minutes. This is the stress scan of the heart.

Any areas of the heart that have blocked or partially blocked arteries will be seen on the scans as "cold spots," or "defects," because these areas will be unable to absorb the radionuclide into the heart.

## Pre-Registration and Testing Location

Our office will call you 2 days before the date your test is scheduled to confirm your appointment. At this time we can also answer questions you may have. Please have your referring physician complete the **Nuclear Cardiology Order Form**. Plan to arrive 20 minutes before the scheduled time of your test. Bring your insurance cards with you. Go directly to the test location.

Nuclear Cardiology studies are performed at:

### **The Weill Greenberg Center**

1305 York Avenue (corner of E70 Street and York Avenue)

New York, NY 10021

Nuclear Cardiology studies are performed on the 8th floor.

**646-962-3139**

## Before the Procedure

- You will need to avoid taking anything with caffeine for 18 hours before the test, including: coffee or tea (even decaffeinated), chocolate, or sodas. Medications that contain caffeine should also be held for 18 hours. Some over-the-counter medications that contain caffeine include Anacin, Excedrin, and NoDoz. Theophylline medications should be stopped 48 hours prior to the test. Consult your physician for specific instructions.
- Fasting (No food or liquids) is required for 4 hours before the procedure.
- If you are diabetic, please consult your physician for special instruction on when to take your diabetes medications.
- Do not apply any creams, lotions, or powder to your chest area on the day of your test.
- The procedure will be explained to you and you will have the opportunity to ask any questions that you might have about the procedure.
- You will be asked to sign a consent form that gives your permission to perform the test. Read the form carefully and ask questions if something is not clear.
- If you are pregnant or suspect that you may be pregnant, you must notify the staff.
- Notify the staff of all medications (prescription and over-the-counter) and herbal supplements that you are taking.

- Notify the staff if you have a pacemaker or defibrillator.
- Please wear comfortable clothing as well as a pair of comfortable walking shoes or sneakers.
- Based upon your medical condition, your physician may request other specific preparation.

## **Nuclear Stress Procedure**

A nuclear stress test may be performed on an outpatient basis or as part of your stay in a hospital. Procedures may vary depending on your condition and your physician's practices. Generally, a nuclear stress test scan follows this process:

- You will be asked to remove any jewelry or other objects that may interfere with the pictures of your heart.
- You will be given a gown to wear.
- An intravenous catheter will be placed in your arm or hand.
- You will be connected to an ECG machine with leads and a blood pressure cuff will be placed on your arm.

## **During a Nuclear Stress Test With Exercise**

- You will exercise on a treadmill. The intensity of the exercise will be gradually increased by increasing the speed and incline of the treadmill.
- Your heart rate and blood pressure will be monitored. Once you have reached your maximal exercise point (determined by your heart rate and age), the radionuclide will be injected through the intravenous catheter.
- After the radionuclide has been injected, you will need to continue to exercise for one to two minutes more to let the radionuclide circulate. The treadmill is then slowed down and stopped.

## **During a Pharmacological ("Chemical") Nuclear Stress Test**

- You will not exercise on a treadmill. Instead, a medication is injected through the intravenous catheter to simulate the stress.
- Your heart rate and blood pressure will be monitored.
- The radionuclide will be injected through the intravenous catheter.

## **Procedure Completion, Both Methods**

- If you experience any symptoms such as chest pain, shortness of breath, dizziness or severe fatigue at any point during the procedure, let the physician, nurse or technologist know.
- Once you reach baseline values (heart rate and blood pressure) you will be disconnected from the EKG machine and informed of the waiting time before the final set of post-stress images.

## **During the Imaging Procedure**

- You will lie flat on the solid state camera while the images of your heart are obtained.
- If possible, your arms will be positioned above your head. It will be necessary for you to lie very still while the images are being taken, as movement can adversely affect the quality of the images.
- After both the rest and stress scans have been completed and processed, you will be informed that you are finished with the test.
- The physician who referred you for the nuclear stress test will receive the results no later than the next business day.

## **Contact**

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### **Nuclear Cardiology Laboratory**

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