

Cardiac Molecular Perfusion Imaging (Nuclear Cardiology)

What is cardiac molecular perfusion?

Cardiac molecular [moh-LEK-yoo-lahr] **perfusion** [per-FYOO-zhun] **imaging** is a basic test to check the health of your heart and arteries. Your doctor might also refer to it as a SPECT scan, a nuclear scan, a cardiolyte [CAR-dee-oh-lite] scan, or a sestamibi [ses-tah-MIH-bee] scan.

During this test, a chemical “tracer” that gives off a small amount of radiation is injected into your bloodstream. As the tracer moves to your heart, the radiation creates an image on a machine called a **gamma camera**. Areas that don’t get enough blood show up as dark spots on the image.

Why do I need this test?

Your doctor might recommended this test for several reasons. It can be helpful if you’ve had chest pains, a heart attack, or other heart disease symptoms. Cardiac molecular imaging can be used to:

- Find out whether or not you have coronary artery disease and how much of your arteries are blocked
- Test your heart for damage after a heart attack
- Check how well bypass surgery or other treatment has improved blood flow to the heart



What do I need to do next?

- 1 Tell your doctor about all medicines you are taking.** Include all prescriptions, over-the-counter drugs (such as allergy pills or cough syrup), inhalers, patches, vitamins, and herbal remedies.
- 2 Follow your doctor’s instructions about your medicines.** You may need to stop taking some medicines before the test, such as nitrates, beta blockers, calcium channel blockers, dipyridamole [die-puh-RID-eh-muhl], and theophylline [thee-OFF-uh-lin].
See a complete list of food and drug items to avoid before your test on [page 2](#).
- 3 Tell your doctor if you have diabetes** and use insulin or another medicine to lower blood glucose.
- 4 Tell your doctor if you are allergic to any medicine,** if you have asthma, wheezing, long-term lung disease, or if you have claustrophobia [claw-struh-FOH-bee-yuh] (a fear of tight spaces).
- 5 Avoid eating for 6 hours before the test** or as directed by your doctor. If you have diabetes, ask your doctor for special directions.
- 6 Ask your doctor about the test schedule.** The test may happen on 2 separate days, or it may happen on 1 day. If the test happens on a single day and has 2 parts, you may need to wait for a few hours between the parts.
- 7 Dress for comfort.** Wear comfortable clothes and walking shoes.

Talking with your doctor about this test

The table below lists the most common benefits, risks, and alternatives for cardiac molecular perfusion imaging. Other benefits and risks may apply in your unique medical situation. Talking with your doctors is the most important part of learning about these risks and benefits. If you have questions be sure to ask them.

Possible benefits	Possible risks and complications	Alternatives
<p>This test provides information about problems with blood flow to your heart or heart muscle damage. It can help in diagnosing coronary artery disease and planning treatment.</p> <p>This test doesn't involve any incisions or surgery (non-invasive).</p>	<p>While cardiac molecular perfusion imaging is generally very safe, there can be risks with any diagnostic test. Risks and potential complications include:</p> <ul style="list-style-type: none"> • Symptoms caused by the extra workload on your heart during the stress test, such as chest pain, high blood pressure, irregular heartbeats, dizziness, nausea, or heart attack. You will be carefully monitored during the test to prevent these symptoms or to react quickly if they occur. • Exposure to radiation, which can slightly increase your lifetime cancer risk (for more information, see Intermountain's <i>Guide to Understanding Radiation</i>). • Allergic reaction to medicine given to stress your heart if you can't exercise (extremely rare). 	<p>Other tests used in diagnosing coronary artery disease include:</p> <ul style="list-style-type: none"> • Blood tests • Electrocardiogram (ECG) • Echocardiogram • Stress test with echocardiogram or ECG • Angiogram (cardiac catheterization) • Chest X-ray or cardiac CT scan <p>Ask your doctor to explain these tests and how they are different from a cardiac molecular perfusion scan</p>

Products to avoid before your test

Stimulants are products that can make your heart beat faster than normal. Avoid the following as they could interfere with your test:

- **Food and drinks containing caffeine:** Chocolate and cocoa, coffee and tea (including decaffeinated or herbal teas), any kind of soda pop (including regular and "caffeine-free" colas and root beer) diet supplements (including energy bars, energy drinks, and products containing guarana)
- **Prescription drugs containing caffeine:** Cafergot, Esgic, Fioricet, Fiorinal, Norgesic, Norgesic Forte, Synalgos-DEC, Wigraine
- **Over-the-counter medicines containing caffeine, theophylline, or both:** Anacin, Excedrin, Vivarin, NoDoz, Aerolate, Constant-T, Elixophylline, Quibron, Respbid, Slo-bid, Slo-Phyllin, T-Phyl, Tedral SA, Theo-24, Theoclear, Theo-Dur, Theolair, Theo-Organidin, Theo-Sav, Theostat, Theo-X

This is only a partial list. Talk with your doctor or pharmacist if you have any questions about the foods and medicines you should avoid before your test.



Where can I learn more?

Learn more about cardiac molecular perfusion imaging at the following links:

- **Radiological Society of North America:** www.radiologyinfo.org/en/info.cfm?pg=cardinuclear
- **American Society for Nuclear Cardiology:** www.asnc.org/content.asp?contentid=6
- **National Heart, Lung, and Blood Institute:** www.nhlbi.nih.gov/health-topics/nuclear-heart-scan

What happens during the test?

Cardiac nuclear imaging can be done while the heart is at rest or while the heart is under stress. Most often, you will have both a resting test and a stress test. Depending on the procedures at your clinic or hospital, either test may happen first.

The resting test

The stress test usually takes about 2 hours. Here's what you can expect:

- 1 You will take off all clothing above the waist and put on a gown. An IV will be placed in your arm or hand, and electrodes (sensors) might be put on your chest to monitor your heart.
- 2 Your heart will be stressed in one of these 2 ways:
 - If you are able, **you will walk on a treadmill**. It starts slowly, and becomes faster and steeper every few minutes until you reach a target heart rate. Healthcare providers will monitor your heart. If you don't feel well, ask them to stop the treadmill. Allow it to stop before you step off.
 - If you can't exercise, **you'll receive medicine through the IV**. Tell your doctors if you have any chest pain, a fluttering heartbeat, trouble breathing, or sweating.
- 3 While your heart rate is high, the radioactive tracer will be injected into your bloodstream through the IV.
- 4 You will lie down on an exam table inside a gamma camera that surrounds your chest.
- 5 The camera will record images of your heart. The radiation will help your doctor see any problems.



You will lie on a table inside a gamma camera, usually with your arms over your head. Pillows will be used to help make you comfortable.

The resting test

The resting test takes about an hour. Here's what happens:

- 1 You'll prepare as described for the stress test.
- 2 You'll lie on an exam table with a gamma camera, as described for the stress test.
- 3 A healthcare provider will use the IV to inject the radioactive tracer. The camera will capture images created by the radiation as you lie still and relax.

What happens afterward?

The IV line and electrodes will be taken off. There is no special self-care needed. Your doctor will talk with you about your test results.



When should I call my doctor?

Call your doctor if you have any heart symptoms after the test, such as:

- A racing or fluttering heartbeat
- Chest pain
- Difficulty breathing.

