

### What is a nuclear ventriculogram?

A nuclear ventriculogram (technically called *radionuclide ventriculography*) is a test that uses a special camera to take a series pictures of the pumping chambers (ventricles) of the heart to check their size and blood-pumping ability.

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The test, also known as a *multigated acquisition scan* (MUGA), does not require entering the body (it is noninvasive). The nuclear ventriculogram is the most accurate test for measuring the pumping function of the heart.

### How does a nuclear ventriculogram work?

The test uses a tiny amount of radioactive material, known as a tracer, which is injected into your arm. The tracer attaches to the red blood cells in your blood, and these "tagged" cells are tracked by a special camera as they travel through the bloodstream and the pumping chambers of the heart. The camera is coordinated with an electrocardiogram (ECG) reading to record images at specific times during the heart's cycle of contraction and relaxation. The information is then processed and reconstructed by a computer to produce moving images of your heart as it pumps.

### Who might have a nuclear ventriculogram?

If your doctor suspects you have heart failure, she or he may order a nuclear ventriculogram to check how well your heart is pumping. The test provides a comprehensive look at blood flow and the function of the lower chambers of the heart. A nuclear ventriculogram is an alternative to the [echocardiogram](#) to determine your [ejection fraction](#) .

A nuclear ventriculogram has an advantage over the standard echocardiogram because it is less affected by excess body fat or breast tissue. Compared with a transesophageal echocardiogram (in which a transducer is passed down the throat to image the heart from inside your body), a nuclear ventriculogram has the advantages of being slightly more accurate and

not requiring a sedative, but the disadvantages of taking longer to perform and exposing you to a small amount of radiation.

### How do I prepare for a nuclear ventriculogram?

You should avoid caffeine (coffee, tea, and soda) and smoking for 48 hours before the test, and remove any jewelry or metallic accessories. Tell your doctor about any prescription or over-the-counter medications you are taking because certain drugs can interfere with the results of the test. Be sure to tell your doctor if you are pregnant or breastfeeding because radiation may be harmful to the fetus and can be passed through breast milk to the baby.

### What happens during a nuclear ventriculogram?

You will remove your clothing from the waist up and put on a hospital gown. Small sticky pads attached to an [ECG machine](#) will be placed on your chest to monitor your heart rate. An intravenous (IV) line will be inserted into your arm; you may feel a slight prick as the IV is inserted. The radioactive tracer will be administered through the IV. You may experience coolness and a flushed sensation for a minute after the tracer is injected.

You will lie flat on an examination table. A large scanning camera above your chest will take several pictures of your heart from different angles. The ECG will be used to coordinate the camera to take a rapid sequence of pictures timed with your heartbeat. You must hold still when the pictures are taken to minimize blurring and make sure your test is as accurate as possible.

Sometimes the test includes an exercise portion, in which you walk on a treadmill until you reach your target heart rate or until you stop because of fatigue or pain. Images will be taken before and after the exercise portion. [Click here](#) for more information on exercise testing for heart failure.

The test takes about 1 or 2 hours. You may be asked to wait while the technician reviews the images and makes sure no more pictures are needed.

### What happens after a nuclear ventriculogram?

After the test is completed, you can eat, drink, and resume normal activities. You should drink plenty of fluids to flush the tracer from your body.

### What do the results of a nuclear ventriculogram mean?

A nuclear ventriculogram evaluates the size of the heart's pumping chambers and if they are working properly. Enlarged ventricles may indicate a weakened heart. Your doctor will measure the amount of blood pumped out (ejection fraction) of the ventricles. A low [ejection fraction](#) means you may have

[systolic heart failure](#)

. If the test shows your heart is pumping out blood normally (your ejection fraction is normal), but not refilling with blood properly, you may have

[diastolic heart failure](#)

A nuclear ventriculogram doesn't show heart muscle wall thickness (hypertrophy) or abnormal heart valves, which can be detected on [echocardiogram](#) or [cardiac MRI](#) .<sup>1</sup>

### What are the risks of a nuclear ventriculogram?

The amount of radiation you are exposed to during a nuclear ventriculogram is considered safe. The benefits of the test far outweigh any potential risks, and the technicians are trained to minimize your radiation exposure. If you are pregnant or breastfeeding radiation may be harmful to the fetus and can be passed through breast milk to the baby.

For more information on radiation safety, see the [National Institutes of Health's Radiation Fact Sheet](#)

### References

1. Hunt SA. ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Update the 2001 Guidelines for the Evaluation and Management of Heart Failure). *J Am Coll Cardiol.* September 20, 2005 2005;46(6):e1-82.

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