

CURIUM™

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What Is Nuclear Medicine?

An Introductory Guide For
Patients And Their Families



What is nuclear medicine?

Nuclear medicine is a type of medical imaging that uses small amounts of radioactive material (called tracers) to help find — and sometimes treat — a variety of diseases, including heart disease, kidney disease, many types of cancers and other health problems. The tracer travels through the body and collects in the organ or area of the body being studied. Here, it gives off energy and a special camera, used to detect these signals, takes pictures. If nuclear medicine is used to help treat your condition, the tracer goes to the diseased area allowing treatment to be focused on that area.

Unlike other imaging tests, diagnostic nuclear medicine scans give doctors important information about how various parts of the body are working. These exams are usually done in a hospital or outpatient clinic. Millions of Americans have nuclear medicine imaging exams each year.

Nuclear medicine is a type of imaging test



Unlike other imaging tests that usually only show the anatomy (structure) of the part of the body being examined, nuclear medicine tests allow doctors to see the structure and real-

time function of organs in the body. These exams can help identify many problems less invasively and, in some cases, much earlier than many other methods. For example, some nuclear medicine scans can look at the body's chemistry and detect small cancerous tumors and subtle changes of function in the brain and heart.

Why has my doctor ordered a nuclear medicine exam?

There are many possible reasons for having a nuclear medicine exam. Nuclear medicine scans may be used to:

- detect certain medical problems.
- monitor changes in the way organs are working in patients with certain conditions (for example, in people with kidney or heart disease).
- check a person's response to treatment.

For example, these tests can help determine if:

- there is enough blood flow to your heart or lungs.
- the brain is receiving adequate blood supply.
- the kidneys, thyroid, gall bladder, liver and other organs are functioning well.
- the stomach is emptying properly.
- there are bone fractures too small to be seen on an x-ray.

They can also help to:

- identify where epileptic seizures, Parkinson's disease and Alzheimer's disease have affected the brain.
- find cancers and determine if they are responding to treatment.
- determine the extent and location of damage to the heart muscle after a heart attack.
- tell physicians how well newly transplanted organs are functioning.



How do nuclear medicine imaging procedures work?

Prior to the exam, you will be given a small amount of radioactive medication, called a tracer. Different tracers target specific organs or tissues in your body. Depending on the part of the body being scanned, you will either receive the medicine by injection (into a vein in your arm or hand), swallowing a pill or inhaling a gas.

Once inside your body, the tracer goes to and collects in the part of the body where a disease or abnormality might exist. Special cameras or scanners are used to detect the tracer in the body and create a series of detailed pictures.

If nuclear medicine is used for treatment, the tracer will travel through the body and deliver medication to the site of the disease.



Is nuclear medicine a new specialty?

No. In fact, nuclear medicine was first used in patients over 60 years ago, making it older than other imaging tests such as CT, MRI and ultrasound. In the United States alone, **more than 18 million nuclear medicine procedures are performed every year.**¹ Advances in nuclear medicine are made daily, thanks to many active research programs.

1 Goethals P, Zimmermann R. Nuclear Medicine Market, Nuclear Medicine Procedures. In: Nuclear Medicine World Market Report and Directory. MEDrays Intell. June 2016: 45.

Are there any safety concerns with these tests?

Don't let the words "nuclear" or "radioactivity" scare you. These tests are designed to expose you to the least amount of radiation possible. The drug or drugs that will be used during the nuclear medicine test are prepared with exceptional care and have been approved by the U.S. Food and Drug Administration. However, there is always a chance that you may have a reaction to the drugs. It is important to tell your doctor or the person conducting the exam about unusual reactions or feelings you may have during or after the exam.

How do I prepare for my exam?

Before the test, tell your doctor about any allergies you have and provide a list of medicines you are currently taking, including vitamins and supplements.

If you are pregnant, trying to get pregnant or breast feeding, tell your doctor before having the test.

Your doctor will give you specific instructions before your scan. For example, if you need to avoid certain activities or when you need to stop eating, drinking or smoking. Be certain to ask your doctor if you should stop taking certain medications prior to the exam.

What is radiation?

Radiation is simply the release of energy. The most familiar form of radiation is visible light; for example, the sun or that from a light bulb. Other forms of radiation include radio waves, microwaves, ultraviolet light, x-rays, and gamma rays used in medical and diagnostic procedures.

What will the imaging procedure be like?

Here is a basic description of what you can expect. Keep in mind, the process may vary depending on your specific test and where it is performed.

You may be asked to undress and wear a hospital gown. Leave your jewelry at home and be sure to remove any metal objects (for example, belts or change in your pockets).

You will be given a small dose of the tracer material. If needed, the technologist will insert a tube, called an intravenous (IV) line into a vein in your hand or arm. Depending on the type of scan being performed, the imaging will either be done immediately after you receive the tracer, in a few hours or even several days after your injection.

When you are ready for imaging, the technologist will help position you (usually on your back) on an exam table. The tracer emits energy that can be detected by special types of cameras including:

- gamma cameras
- SPECT
- PET

These cameras work with computers to form images that provide detailed information about the area of body being imaged. These cameras come in different shapes and sizes. The doctor will select the best camera type based on which area of the body will be scanned and the best technology available. Some cameras move across the body, some rotate around the body, and some do not move at all. These cameras do not hurt or make any noise. Tell the technologist if you are scared of enclosed spaces (claustrophobic). He or she can help make you more comfortable.

While the images are being taken, you must remain as still as possible. Imaging time varies, generally ranging from 20 to 45 minutes.



Once the test is finished, you may be asked to wait for a short time while the doctor (a radiologist who is trained to read the images), checks to see whether additional pictures are needed.

How will I learn the results of my procedure?

When the test is over, the radiologist will review your images, and send a written report to your doctor. Your doctor will then discuss the results with you. Be sure to ask your doctor what the test results mean and what you should do next.

Talking with your health team.

Be sure to talk with your health team if you have any concerns. Here are some questions you might want to ask your doctor:

- Why is this test being ordered?
- How long does the test take?
- What can I expect during the exam?
- Is it safe?
- Will this test be covered by my health insurance?
- When will I get the results?
- When will I be able to resume normal activities?



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Your examination has been
scheduled for:

Location: _____

Doctor: _____

Phone: _____

Date: _____

Time: _____



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www.curiumpharma.com

111 Westport Plaza | Suite 800 | St. Louis, MO 63146

888-744-1414 | NuclearMedicine@curiumpharma.com