

Nuclear Medicine

What is General Nuclear Medicine?

Nuclear medicine is a subspecialty within the field of radiology. It comprises diagnostic examinations that result in images of body anatomy and function. The images are developed based on the detection of energy emitted from a radioactive substance given to the patient, either intravenously or by mouth. Generally, radiation to the patient is similar to that resulting from standard x-ray examinations.

What are some common uses of the procedure?

Nuclear medicine images can assist the physician in diagnosing diseases. Tumors, infection and other disorders can be detected by evaluation organ function. Specifically, nuclear medicine can be used to:

- n Analyze kidney function.
- n Image blood flow and function of the heart.
- n Scan lungs for respiratory and blood-flow problems.
- n Identify blockage of the gallbladder.
- n Evaluate bones for fracture, infection, arthritis or tumor.
- n Determine the presence or spread of cancer.
- n Identify bleeding into the bowel.
- n Locate the presence of infection.
- n Measure thyroid function to detect an overactive or under active thyroid.

How should I prepare for the procedure?

Usually, no special preparation is needed for a nuclear medicine examination, however, if the procedure involves evaluation of the stomach, you may have to skip the meal immediately before the test. If the procedure involves evaluation of the kidneys, you may need to drink plenty of water before the test.

How does the procedure work?

You are given a small dose of radioactive material, usually intravenously but sometimes orally, that localizes in specific body organ systems. This compound, called a radiopharmaceutical or tracer, eventually collects in the organ and gives off energy as gamma rays. The gamma camera detects the rays and works with a computer to produce images and measurements of organs and tissues.

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How is the procedure performed?

A radiopharmaceutical is usually administered into a vein. Depending on which type of scan is being performed, the imaging will be done either immediately, a few hours later, or even several days after the injection. Imaging time varies, generally ranging from 20 to 45 minutes.

The radiopharmaceutical that is used is determined by what part of the body is under study since some compounds collect in specific organs better than others. Depending on the type of scan, it may take several seconds to several days for the substance to travel through the body and accumulate in the organ under study, thus the wide range in scanning times.

While the images are being obtained, you must remain as still as possible. This is especially true when a series of images are obtained to show how an organ functions over time.

After the procedure, a physician with specialized training in nuclear medicine checks the quality of the images to ensure that an optimal diagnostic study has been performed.

What will I experience during the procedure?

Some minor discomfort during a nuclear medicine procedure may arise from the intravenous injection, usually done with a small needle. With some special studies, a catheter may be placed into the bladder, which may cause temporary discomfort. Lying still on the examining table may be uncomfortable for some patients.

Most of the radioactivity passes out of your body in urine or stool. The rest simply disappears through natural loss of radioactivity over time.

Who interprets the results and how do I get them?

Most patients undergo a nuclear medicine examination because their primary care physician has recommended it. A radiologist who has specialized training in nuclear medicine will interpret the images and forward a report to your physician. It usually takes a day or so to interpret, report and deliver the results.

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