

What is Nuclear Medicine?

Nuclear medicine is a form of sensitive imaging that uses minimal amount of radioactive material to diagnose and treat diseases such as cancers, heart diseases, gastrointestinal, brain and endocrine (thyroid, parathyroid) disorders. These tests can detect diseases at very early stage before it can be seen on any other imaging methods.

Diagnosis

Depending on the type of nuclear test, the radiotracer is either injected, swallowed or inhaled as a gas which eventually collects and accumulates in the organ or area of the body being imaged.

Treatment

Nuclear medicine also offers a wide range of therapeutic procedures like radioactive iodine (I-131) therapy to treat thyroid cancer and benign thyroid diseases. Nuclear medicine also offers treatment for bone pains from the spread of cancer, thickening of blood, and tumours originating from the endocrine and nervous system.

What are some common uses of the procedure?

Radioactive materials are used in imaging procedures to visualise the structure and function of different organs in the body. This procedure can be used to diagnose and stage

cancers and see the response to therapy. It can also identify and locate other abnormalities or disorders of various organs.

Nuclear medicine therapies:

- Radioactive iodine (I-131) to treat overactive thyroid gland (hyperthyroidism) and thyroid cancer.
- Radioactive materials to treat pain from spread of tumour to the bones.

How can I prepare for the procedure?

Preparation for different scans varies from fasting for some hours, discontinuing different medications, avoiding beverages and is based on the scan that you will undergo. Physician can ask about any medication that you are taking and advise discontinuing it. The doctor will also ask about any allergy that you might have. All women should always inform their physician if there is any possibility that they are pregnant or if they are breastfeeding. If required, a pregnancy test will be performed before the procedure.

How does the procedure work?

With ordinary x-ray examinations, an image is made by passing x-rays through the body from an outside source. In contrast, nuclear medicine procedures use a radioactive material called a radio-pharmaceutical or radiotracer, which is injected into your blood, swallowed or inhaled. This radioactive material accumulates in the organ or area of your body being examined, where it gives off gamma rays. A gamma

camera, PET scanner or probe detects this radiation and with the help of a computer creates pictures.

How is the procedure performed?

Nuclear medicine imaging is usually performed on an outpatient basis, but can be performed on hospitalised patients.

You will be positioned on an examination table. If necessary, a nurse or technologist will insert an intravenous line into a vein in your hand or arm.

It can take anywhere from several seconds to several days for the radiotracer to travel through your body and accumulate in the organ or area being studied. As a result, imaging may be done immediately, a few hours later, or even several days after you have received the radioactive material.

While the camera is taking pictures, you will need to remain still for brief periods of time. In some cases, the camera may move very close to your body. This is necessary to obtain the best quality images. If you are afraid of closed places, you should inform the staff.

Young children may require gentle wrapping or sedation to help them hold still. If your doctor feels sedation is needed for your child, you will receive specific instructions regarding when and if you can feed your child on the day of the exam. A doctors' team will be available during the exam to ensure your child's safety while under the effects of sedation.

When the examination is completed, you may be asked to wait until the technologist checks the images in case additional images are needed. Occasionally, more images are obtained for clarification or better visualisation of certain areas or structures. The need for additional images does not necessarily mean there was a problem with the exam or that something abnormal was found, and should not be a cause of concern for you.

If you had an intravenous line inserted for the procedure, it will usually be removed unless you are scheduled for an additional procedure that same day requires an intravenous line.

During radioactive iodine (I-131) therapy, which is most often an outpatient procedure, the radioactive iodine is swallowed, either in capsule or liquid form. Patients receiving high dose radioactive iodine are admitted, as per international recommendation till radiation exposure is within accepted limits.

What will I experience during and after the procedure?

Most nuclear medicine procedures are painless and are rarely associated with significant discomfort or side effects.

When the radiotracer is given intravenously, you will feel a slight pin prick when the needle is inserted into your vein.

When swallowed, the radiotracer has little or no taste. When inhaled, you should feel no

differently than when breathing room air or holding your breath.

With some procedures, a catheter may be placed into your bladder, which may cause temporary discomfort.

Unless your physician tells you otherwise, you may resume your normal activities after your nuclear scan. If any special instructions are necessary, you will be informed by a technologist, nurse or physician before you leave the Nuclear Medicine department.

It may also pass out of your body through your urine or stool during the first few hours or days following the test. You should also drink plenty of water to help flush the radioactive material out of your body, need to flush two times well after passing urine or stools.

Who interprets the results and how do I get them?

Nuclear Medicine Physicians administer radionuclide therapies and interpret the images. Registered hospital patients will get their reports from the medical record department in Services Building. The outside referred patients will get their reports the next day from the reception of nuclear medicine

Is the scan dangerous?

Nuclear medicine tests are very safe because very small amount of radioactive material is used.

What happens afterwards?

You can go home as soon as the scan is completed. You need to follow the doctor's instructions after the scan.

What if I cannot keep my appointment?

You should contact the Nuclear Medicine department as soon as possible on the telephone numbers given below. The staff in the Nuclear Medicine Department will be happy to answer any questions you may have.

Where can you get help?

If you have any queries or problems related to your procedure, please contact the Nuclear Medicine Department at +92 42 3590 5000 Ext. 4192 or 4193.

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INTRODUCTION TO NUCLEAR MEDICINE

