Nuclear medicine patient guidelines

What is General Nuclear Medicine

Nuclear medicine is a branch of medical imaging that uses small amounts of radioactive material to diagnose and determine the severity of or treat a variety of diseases, including many types of cancers, heart disease, gastrointestinal, endocrine, neurological disorders and other abnormalities within the body. Because nuclear medicine procedures are able to pinpoint molecular activity within the body, they offer the potential to identify disease in its earliest stages as well as a patient’s immediate response to therapeutic interventions.

Diagnosis

Nuclear medicine imaging procedures are noninvasive and, with the exception of intravenous injections, are usually painless medical tests that help physicians diagnose and evaluate medical conditions. These imaging scans use radioactive materials called radiopharmaceuticals or radiotracers.

Depending on the type of nuclear medicine exam, the radiotracer is either injected into the body, swallowed or inhaled as a gas and eventually accumulates in the organ or area of the body being examined. Radioactive emissions from the radiotracer are detected by a special camera or imaging device that produces pictures and provides molecular information.

In many centers, nuclear medicine images can be superimposed with computed tomography (CT) or magnetic resonance imaging (MRI) to produce special views, a practice known as image fusion or co-registration. These views allow the information from two different exams to be correlated and interpreted on one image, leading to more precise information and accurate diagnoses. In addition, manufacturers are now making single photon emission computed tomography/computed tomography (SPECT/CT) and positron emission tomography/computed tomography (PET/CT) units that are able to perform both imaging exams at the same time. An emerging imaging technology, but not readily available at this time is PET/MRI.

Therapy

Nuclear medicine also offers therapeutic procedures, such as radioactive iodine (I-131) therapy that use small amounts of radioactive material to treat cancer and other medical conditions affecting the thyroid gland, as well as treatments for other cancers and medical conditions.

Non-Hodgkin's lymphoma patients who do not respond to chemotherapy may undergo radioimmunotherapy (RIT).

Radioimmunotherapy (RIT) is a personalized cancer treatment that combines radiation therapy with the targeting ability of immunotherapy, a treatment that mimics cellular activity in the body's immune system.

What are the preparations

Physicians use radionuclide imaging procedures to visualize the structure and function of an organ, tissue, bone or system within the body.

Types of scans:
Heart:

- **Cardiac Shunt Detection**: No barium contrast studies for 48 hours prior to exam.

- **Cardiac Stress Testing (MPI; Lexiscan, Dobutamine)**: No Food or drink for 4-6 hours prior to exam, Check with Cardiologist before holding any medications, No caffeine for 24 hours, No barium contrast studies for 48 hours prior to exam. Wear two-piece outfit, short sleeve shirt.

- **Multigated Acquisition scan MUGA**: No barium contrast studies for 48 hours prior to exam. Exam will take approximately 1 hour for imaging.

Lung:

- **Lung Perfusion/Ventilation**: No barium contrast studies for 48 hours prior to exam. Exam will take approximately 1 hour for imaging; must have chest x-ray within 12 hours of nuclear exam.

Bones:

- **Bone Imaging**: No barium contrast studies for 48 hours prior to exam. There will be two different appointments for this exam.

Brain:

- **Brain Perfusion**: No Preparation. Exam will take approximately 1 hour to complete.

- **Brain SPECT (DaTscan)**: Contraindications: Pregnancy & Breast feeding; Patient must be able to lie flat on back with head tilted backwards for approximately 1 hour. There will be 3 appointments for this exam. Please notify your doctor if you are currently taking any of these medications and follow your physician’s instruction about your medications. Amoxapine, Citalopram, Norephedrine, Sertraline, Amphetamine, Cocaine, Paroxetine, Benztropine, Mazindol, Phentermine, Bupropion, Methamphetamine, Phenylpropanolamine, Buspirone, Methylphenidate, Selegiline.

- **Cisternography**: No barium contrast studies for 48 hours prior to exam.

Abdominal:

- **Gastric Empty**: No barium contrast studies for 48 hours prior to exam Nothing to eat or drink after midnight. Exam will take approximately 2 hours to complete.

- **GI Bleed**: No barium contrast studies for 48 hours prior to exam. Exam will take approximately 2 hours to complete.

- **Hida Scan (Hepatobiliary Scan w/or w/out CCK (Gall bladder Imaging))**: Nothing to eat or drink (not even water) for 4 hours prior to exam. If eating 4 hours prior, eat light and consume no dairy. No barium contrast studies for 48 hours prior to exam. No muscle relaxers for 24-48 prior to exam. No opiate-based narcotics for 24-48 hours prior to exam. Exam will take approximately 2-4 hours for imaging.

- **Liver Spleen**: No barium contrast for 48 hours prior to exam.
- **Meckel’s Diverticulum**: No barium contrast studies for 48 hours prior to exam. Exam will take approximately 1 hour for imaging.

- **Renal**:
  - **Captopril Renal**: Patients must bring Captopril medication with them (50 mg usually in two 25 mg tablets); ACE inhibitors and diuretics may decrease the accuracy of the test. (Discontinue for 2-3 days.) Discontinue calcium antagonists 2-3 days prior to exam. No barium contrast studies for 48 hours prior to exam.
    - **Drink 16 ounces of water 1 hour prior to exam** (yes, you may go to the bathroom) but no solid food for 4 hour prior to the study. Exam will take approximately 2 hours to complete.
  - **Lasix Renal**: ACE inhibitors and diuretics may decrease the accuracy of the test. (Discontinue for 2-3 days.) Discontinue calcium antagonists 2-3 days prior to exam. No barium contrast studies for 48 hours prior to exam.
    - **Drink 16 ounces of water 1 hour prior to exam** (yes, you may go to the bathroom) but no solid food for 4 hour prior to the study. Exam will take approximately 2 hours to complete.
  - **Renal**: No barium contrast studies for 48 hours prior to exam. Drink 16 ounces of water 1 hour prior to exam (you may use the bathroom as needed) Exam with approximately 1 hour for imaging.

- **Thyroid**:
  - **Thyroid Uptake and Scan (I-123 Sodium Iodine), or I-123/I-131 Whole Body Scan**: No multivitamins for 48 hours prior to exam. No thyroid medications for 2-4 weeks depending on type; please call 508.862.5326. No shellfish for 2 weeks prior to exam. No Iodine based contrast for 4 weeks prior to examination. Please do not eat 4 hours prior to your appointment. Must not be pregnant or breastfeeding. Must have current blood work values, TSH, T3, T4, at the time of scheduling.
  - **Thyroid imaging w/Te99m**: No barium contrast studies for 48 hours prior to exam.

  No thyroid medications please see below.

  The patient must discontinue iodide containing preparations and medications that could potentially affect the ability of thyroid tissue to accumulate iodide. Must stop Propylthiouracil, methimazole, or carbimazole medications for 3 days prior to administration. Stop using Triiodothyronine (T-3) for 10 days prior to administration. Stop using Thyroxine (T-4) for 3 weeks prior to administration. Stop expectorants, kelp, multivitamins, topical iodide for 3 weeks prior to administration. Stop Amiodarone for 3 weeks prior to administration. No radiographic contrast agents for 3 weeks prior to administration.
  - **Must have current blood work scanned into system along with order at the time of scheduling**

  - **Parathyroid**: No barium contrast studies for 48 hours prior to exam. Exam with have multiple appointments each lasting approximately 1 hour.
**Prostate:**

**ProstaScint In-111:** No barium contrast studies for 48 hours prior to exam. Bowel Prep may be required (over the counter at Drug Stores). Lactation and pregnancy are contraindicated for this exam. There will be 3 to 4 appointments for this exam over multiple days.

**Other types of scans:**

**Infection Imaging (GA-67):** No barium contrast studies for 48 hours prior to exam. Bowel Prep may be required (over the counter at Drug Stores). We recommend a mild laxative, e.g. bisacodyl or lactulose, the day before and the day of injection of the radiopharmaceutical. Lactation and pregnancy are contraindicated for this exam. There will be 3 to 4 appointments for this exam over multiple days.

**Leveen Shunt or Denver Shunt:** No barium contrast studies for 48 hours prior to exam. Exam will take 2-3 hours for imaging.

**Lymph Node Injection Only:** No barium contrast studies for 48 hours prior to exam. Inject the radiopharmaceutical before performing guide wire localization.

**WBC or White Blood Cell w/In-111:** No barium contrast studies for 48 hours prior to exam.

**Tumor Imaging:** No barium contrast studies for 48 hours prior to exam. Bowel Prep may be required. Lactation and pregnancy are contraindicated for this exam. There will be 3 to 4 appointments for this exam.

**Octreoscan:** No barium contrast studies for 48 hours prior to exam. No Somastatin-receptor medications (such as Sandostatin) for 3 days prior to exam. (Octreotide therapy may not need to be stopped prior to the study). Hydrate patients with at least two glasses of water to enhance renal clearance. We recommend a mild laxative, e.g. bisacodyl or lactulose, the day before and the day of injection of the radiopharmaceutical.

**Melanoma:** No barium contrast studies for 48 hours prior to exam. Exam will take 1-3 hours for imaging.

**Therpies:**

**Quadramet:** Must have written Directive and blood work results prior to ordering exam. If female of child-bearing age, a negative pregnancy test must be obtained within 24 hours of treatment. Breast feeding must be discontinued. Decreased renal function decreases clearance from the blood and increases bone marrow toxicity. Patients with severe renal insufficiency should be excluded. Obtain a recent complete blood count:
A low white blood cell count (< 3,000) is a relative contraindication.

A low platelet count (< 60,000) is a relative contraindication.

Anemia can be corrected with transfusions.

Patients with urinary incontinence:

Give instructions in toilet discipline. If needed Catheterize for 2 days.

Situations that are not contraindications:

Previous heavy external beam irradiation; Previous treatment with Sr-89 or Sm-153-EDTMP including failure of response; Anemia.

-Thyroid Therapy: Must have written Directive and Blood Work (for pregnancy results) results prior to ordering exam. If female of child-bearing age, a negative pregnancy test must be obtained within 24 hours of treatment. Breast feeding must be discontinued. No thyroid medications please see below.

The patient must discontinue iodide containing preparations and medications that could potentially affect the ability of thyroid tissue to accumulate iodide. Must stop Propylthiouracil, methimazole, or carbimazole medications for 3 days prior to administration. Stop using Triiodothyronine (T-3) for 10 days prior to administration. Stop using Thyroxine (T-4) for 3 weeks prior to administration. Stop expectorants, kelp, multivitamins, topical iodide for 3 weeks prior to administration. Stop Amiodarone for 3 weeks prior to administration.

No radiographic contrast agents for 3 weeks prior to administration.

**Must have current blood work scanned into system along with order at the time of scheduling (i.e. thyroid uptake and scan values/images)**