Nuclear Medicine

Nuclear medicine imaging is a subspecialty of diagnostic radiology that uses small amounts radioactive material to help to diagnosis and treat of disease. Nuclear Medicine is often used to evaluate how an organ or tissue is functioning, by assessing the metabolism and/or blood flow of the organ or tissue. The radioactive materials, called radiopharmaceuticals, give off energy in the form of gamma rays. Gamma cameras, positron emission tomography (PET) scanners, and/or probes are used to detect these energy levels, which produce special pictures for analysis. The small amount of radioactive material used is equivalent to a traditional X-ray, so it is within safe limits.

What Happens During a Nuclear Medicine Procedure?

During a Nuclear Medicine test the small amount of radiopharmaceutical will be injected, swallowed or inhaled depending on which part of the body your physician desires to examine further. These tests are safe and painless. A gamma camera, PET scanner or probe, will then be used to evaluate the effects of the radiopharmaceutical in order to create images of the body. Nuclear medicine is unique to other forms of imaging because it is used to examine the biological changes within the body versus the anatomy changes.

Common Applications for Nuclear Medicine Exams

Neurologic Applications

- Stroke
- Alzheimer's Disease
- Demonstrate Changes in AIDS Dementia
- Evaluate Patients for Carotid Surgery
- Localize Seizure Foci
- Evaluate Post Concussion Syndrome
- Diagnose Multi-Infarct Dementia

Oncologic Applications

- Tumor Localization
- Tumor Staging
- Identify Metastatic Sites
- Judge Response to Therapy
- Relieve Bone Pain Caused by Cancer

Orthopedic Applications

- Identify Occult Bone Trauma (Sports
- Injuries)
- Diagnose Osteomyelitis
- Evaluate Arthritic Changes and Extent
- Localize Sites for Tumor Biopsy
- Measure Extent of Certain Tumors
- Identify Bone Infarcts in Sickle Cell Disease

Renal Applications

- Detect Urinary Tract Obstruction
- Diagnose Renovascular Hypertension
- Measure Differential Renal Function
- Detect Renal Transplant Rejection
- Detect Pyelonephritis
- Detect Renal Scars

Cardiac Applications

- Coronary Artery Disease
- Measure Effectiveness of Bypass Surgery
- Measure Effectiveness of Therapy for Heart
- Failure
- Detect Heart Transplant Rejection
- Select Patients for Bypass or Angioplasty
- Identify Surgical Patients at High Risk for
- Heart Attacks
- Identify Right Heart Failure
- Measure Chemotherapy Cardiac Toxicity
- Evaluate Valvular Heart Disease
- Identify Shunts and Quantify Them
- Diagnose and Localize Acute Heart Attacks
- Before Enzyme Changes

Pulmonary Applications

- Diagnose Pulmonary Emboli
- Detect Pulmonary Complications of AIDS
- Quantify Lung Ventilation and Perfusion
- Detect Lung Transplant Rejection
- Detect Inhalation Injury in Burn Patients

Other Applications

- Diagnose and Treat Hyperthyroidism
- (Graves' Disease)
- Detect Acute Cholecystitis
- Chronic Biliary Tract Disfunction

- Detect Acute Gastrointestinal Bleeding
- Detect Testicular Torsion
- Detect Occult Infections
- Diagnose and Treat Blood Cell Disorders