What is Nuclear Medicine?

- It is a system of Diagnostic and Therapeutic practice that uses controlled amounts of radioactive material.
- It facilitates diagnosis and treatment of a variety of diseases i.e. many types of cancer, heart disease, gastrointestinal, endocrine, neurological disorders, etc.
- It is unique because it provides information about both structure and function of the body.
- Nuclear Medicine imaging provides unique information that often cannot be obtained using other imaging procedures.
- Information is retrieved without surgery or expensive diagnostic testing.
- It offers the potential to identify disease in its earliest stages.

What is unique about the Asiri Nuclear Medicine Unit?

- Our team consists of highly qualified, overseas trained and well experienced panel of clinicians.
- Our Nuclear Medicine Unit works in close partnership with and under the supervision of International Atomic Energy Agency (IAEA) and Sri Lanka Atomic Energy Authority (AEA) to ensure international standards are maintained and delivered.

What are the special services we offer?

- For diagnosis of cancer.
- Staging and restaging of cancer with treatment.
- For detection of recurrence of cancer.
- Radioactive I131 ablative dose for thyroid remnant ablation in Differentiated Thyroid Cancer following Total Thyroidectomy.
- Radioactive I131 suppressive dose for patients with Thyrotoxicosis.
Positron Emitting Tomography (PET/CT Scan)

This is a Tomographic Technique that computes the three dimensional distribution of radioactivity based on the annihilation photons that are emitted by Positron Emissions known as radiotracers. PET allows a minimally-invasive, quantitative assessment of biochemical and functional processes.

The most commonly used tracer is the Glucose analogue FDG or Fluorodeoxyglucose. FDG accumulation in tissues is proportional to the amount of Glucose utilization. After administration of an adequate amount of FDG, static images are acquired approximately 40-60 minutes after the administration of FDG. FDG PET/CT is a sensitive imaging modality for the detection, staging, as well as for assessment of therapy response in Oncology.

Indications

- Primary presentation:
  - Diagnosis, unknown
  - Primary malignancy
- Staging on presentation
- Response evaluation
- Establishing and localizing disease sites as a cause for elevated serum markers
- Image guided biopsy and radiotherapy planning

Patient Preparation

The main purpose of the patient preparation is to reduce tracer uptake in normal tissue while maintaining and optimizing tracer uptake in the target structures such as tumor tissues. Hence blood glucose must be within acceptable levels. Also, serum creatinine levels should be within acceptable range.
Outstanding flexibility for easy patient set-up and positioning
- Accommodates virtually ANY patient
- Patient-friendly system design – easily accommodates even large patients without claustrophobia
- Unique cardiac imaging configuration
- Exceptional detector flexibility
- HD detector technology – more confidence, improved clinical outcomes, lower re-admission rates
- Industry’s highest collimation sensitivity
- Lowest pallet attenuation
- Best NEMA Reconstruction Resolution
- Supports gurney and hospital bed imaging

Available facilities
- DTPA scans – to evaluate kidney functions before and after renal transplantation
- DMSA scans – to detect and evaluate renal scarring or for the diagnosis of acute pyelonephritis
- Tc 99 Whole body scans – can help diagnose a number of bone conditions including cancer, bone inflammation, fractures, bone infection.
- Thyroid scans – to assess thyroid gland size, structure, function and shape toward diagnosing disorders such as tumor, inflammation and cancer
- Whole body imaging – iodine scan after treatment to evaluate potential spread of thyroid cancer
- I 131 whole body scans, following I 131 whole body scan dose or ablative or therapy dose for differentiated thyroid cancer patients
Available facilities (contd.)

- RBC scans – red blood cell scans in the investigation of gastrointestinal bleeding
- Whole body imaging – iodine scan after treatment to evaluate potential spread of thyroid cancer
- Voiding Cystography - to check urine flow through the bladder and urethra. Shows reflux of urine and how well the bladder empties
- Parotid Scintigraphy – for evaluation of salivary gland function
- Testicular scans – for acute and sub-acute scrotal pain, especially testicular torsion and epididymitis

Scans available on request

- Brain SPECT scan to evaluate memory loss
- Lymphoscintigram – highly sensitive in the localization of sentinel nodes and nodal drainable patterns not routinely accessible in patients in truncal melanomas, breast cancer and prostate cancer to determine surgical or radiation therapy
- Myocardial Perfusion Studies – to detect physiologic and anatomic abnormalities of the heart and determine prognosis
- Hepatobiliary scans – for patients with liver and biliary system ailments
- Lung scans – to determine the likelihood of pulmonary embolism
- Parathyroid scans – designed to localize parathyroid adenomas or parathyroid hyperplasia in patients with hyperthyroidism determined via elevated parathyroid hormone levels
- Gastric Emptying and Esophageal Reflux to diagnose Hiatal Hernia, Gastroesophageal Reflux and Esophageal Motility
- Liver Spleen Colloid scan – Assessing the size, shape and position of the liver and spleen, evaluating hepatic function in acute or chronic liver disease, identifying functioning splenic tissue, evaluating suspected functional asplenia

Procedures we offer

Asiri Health offers a comprehensive range of medical procedures that are therapeutic or help diagnosis.

- Brain SPECT (ECD)
- Brain SPECT (HMPAO)
- Captopril Renal Scan Portocel (Baseline + Captopril) DTPA
- Citernography (DTPA)
- Direct Voiding Crystography (DTPA)
- DMSA Renal Scan
- DTPA Renal Scan (GFR, Function, Diuretic)
- DTPA Renal Scan with MCU
- Gastric Emptying (COLLOID)
- GE Reflux Scan (Milk Scan)
- GI Bleeding Scan
- Hepatobiliary Scan (HIDA)
- Leukosite Imaging (Infection scan) Tc 99m HMPAO labelled WBCS
- Liver Blood Pool Scan (Haemangloma)
- Liver Scan (Phytate)
- Liver Spleen Colloid Scan
- Lung Perfusion Scan (MAA)
- Lung Ventilation + Perfusion Scan (MAA & DTPA)
- Lymphoscintigraphy (Sulfur Colloid)
- Meckels Scan
- Myocardial Perfusion Scan
- Parathyroid Scan (Tetrofosmin)
- Parotid Scintigraphy
- Radionuclide Esophageal Transit Study
- Scintimamography (Sestamibi)
- Testicular Scan
- Thyroid Scan
- Whole Body Radiiodine (Post Therapy)
- Whole Body Tetrofosmin Scan (Tumor Imaging)
- Whole Body Bone Scan (MDP)
- Myocardial Perfusion Scan SPECT (with Cardiologist)
- Myocardial Perfusion Scan SPECT
- Sentinel Lymphnode Imaging (Sulfur Colloid)
How does the Gamma Camera work?

An imaging technique for molecular function of organs (skeleton, thyroid, kidneys, lung, heart, liver, gallbladder, etc.). Gamma Cameras image the radiation emitted from a radioactive pharmaceutical introduced into a patient’s body. It maps early functional changes in disease, compared to other radiological tests like X-ray & CT.

e.g. Bone scans become positive six months before X-ray changes occur.

The Gamma Camera offers a range of advantages for both doctors and patients.

Advantages for Doctors

- Provides molecular activity (functional scan) of skeleton, thyroid, kidneys, lungs, brain, liver, gallbladder, etc.
- Organ specific study can be performed
  e.g. Bone and kidney scans, study of heart, muscle & lung, etc.

Advantages for Patients

- Early diagnosis
- Easy and comfortable procedure
- Economical

Helping to detect:

- Early cancer
- Brain scans – functional studies of brain
- Bone scans – early bone infection or subtle fractures in bones and metastatic bone disease
- Cardiac studies – reversible or irreversible status of muscle damage (myocardial perfusion scan)
- Renal studies – kidney scarring and function, DTPA and DMSA studies
- Thyroid nodule assessment and functional assessment
- Lungs – ventilation and perfusion study V/Q scans
- Liver – hepatobiliary functions
- Endocrine assessment – parathyroid adrenal, etc.
Myocardial perfusion imaging

Reversible ischemia in a patient with multi-vessel coronary artery disease. The scan is suggestive of severe but reversible myocardial ischemia consistent with triple vessel disease.

99mTc MIBI stress rest myocardial perfusion scan shows decreased uptake of the tracer throughout the entire left ventricle at peak stress, especially in the inferolateral and lateral walls, but with complete reversibility shown by normal tracer uptake throughout the myocardium at rest.
Brain perfusion imaging

An early Parkinson’s disease evaluation on a 78-year-old male with mild tremor and rigidity in the hand. The SPECT study shows asymmetrical bilaterally decreased uptake in the putamen with relatively preserved uptake in the caudate nucleus, suggestive of early Parkinson’s disease.

Gurney imaging: gastric emptying

A gastric emptying study performed with gurney imaging on a 34-year-old obese male patient with limited mobility. Initial dynamic images were followed by a static image after one hour post-ingestion of radiolabeled meal. The study shows normal gastric emptying with negligible gastric stasis after one hour.
Lung perfusion imaging

A lung ventilation/perfusion SPECT study performed on a 29-year-old male patient with suspected pulmonary embolism. The SPECT scan shows normal perfusion and ventilation in both lungs.
Bone imaging

A primary bone tumor in the clavicle found in a 62-year-old female patient. The SPECT study shows focal hyper metabolism in an expansible lesion involving the middle third of the clavicle. No other skeletal lesions were visualized. The study is suggestive of a primary bone tumor in the clavicle without metastases. A biopsy was required for histopathological confirmation.