

NUCLEAR MEDICINE PROCEDURES

Theranostics

Targeted Tumour Therapy

Castration resistant prostate cancer (PsmA, Ra223)
(PsmA, Ra223) Neuroendocrine tumors (Mibg/Dota-tate)
Thyroid Cancer (Iodine)
Skin Cancer Therapy, Targeted non-Melanoma Skin Cancer (Re 188-Oncobeta)
Metastatic Melanoma-(Benzamide)
Neutotensin Ligands (Adenocarcinoma)
Scc, ScIc, NsclC, Metastaic Tumours
Fibroblast Activation Protein (FAP)
(Epithelial Cell Tumours Colon, Breast, Pancreatic)
Painful Bone Metastases
Other

Thyroid Cancer Therapy and Imaging

Radioiodine has 3 main indications in the postoperative management of patients with thyroid cancer:
Ablation of residual thyroid tissue with 131-I,
Imaging for possible recurrent disease with 123-I or 131-I,
And treatment of residual or recurrent thyroid cancer with 131-I.
Chylothorax

Tumour Diagnostic Imaging

Tc PSMA/ S186/ OCTREOTIDE/ MIBG
Ga68 PET/CT PSMA/ DOTATATE, FDG PET/CT

Tumour of Primary Unknown
Disease burden (Extend of tumour) with whole body imaging
Residual tumour activity post therapy
Recurrent tumour activity in the midst of post-surgical/ therapeutic changes
Determine sites of biopsy (most metabolic active site)

Benign

Sarcoidosis
Idiopathic lung disease
Other

Parathyroid and Intraoperative Probe Guidance

Localization of parathyroid adenomas

Bone Scintigraphy

Bone pain
Arthritis (seronegative/ seropositive)
Acute and chronic infections of the bone
Non-infective inflammation of the bone
Reflex sympathetic dystrophy syndrome (complex regional pain syndrome, CRPS)
Avascular necrosis or Perthe's disease
Traumatic and Sports injuries of bone
Metabolic disease of bone
Benign and primary malignant bone tumours
Metastatic bone tumours

Thyroid Scintigraphy

Determine the size of the thyroid gland
Differentiate forms of thyrotoxicosis (thyroiditis, factitious hyperthyroidism, Grave's disease, toxic multinodular goitre and toxic adenoma)
Calculate specific doses for treatment of hyperthyroidism
Localization and characterization of thyroid nodules
Determine the function of thyroid nodules
Determine functional status of the thyroid gland
Evaluate presence of ectopic thyroid tissues, thyroglossal and substernal masses

V/Q Scan (Lung Scintigraphy)

ADULT:
Acute or Chronic pulmonary embolism
Evaluation of lung function pre-operatively
Evaluation of alveolar capillary permeability after smoke inhalation injury
Evaluation of lung transplantation
Evaluation of patients with bronchitis or obstructive forms of chronic pulmonary disease
Venoscintigraphy to determine DVT

Paediatric:

Primary abnormalities of the lung and pulmonary vessels
Infective and post-infective lung damage
Evaluation of regional lung function with bronchiectasis
Evaluation of postoperative regional lung function
Cystic fibrosis
Foreign body inhalation
Detection and measurement of right-to-left shunts
Evaluation of aerosol deposition before administration of nebulised drugs

Renal Scintigraphy

Tc 99m MAG3 / Tc 99m DTPA/ GFR
Differential Renal function (contribution of each kidney to global renal function)
Evaluation of obstructive nephropathy and obstructive uropathy associated with hydronephrosis or renal stones, malignancy etc
Evaluation of renal transplantation
Investigation of unknown origin of lumbar pain
Investigation of acute or chronic renal failure
Renal trauma

Tc 99m DMSA Renogram

Assessment of parenchymal involvement in acute pyelonephritis
Assessment of renal infarction and scarring post infective or post vasculitis
Assessment of differential renal function and contribution of single kidney function toward global renal function.
Detection of congenital abnormalities: abnormal duplex kidneys, small kidneys, dysplastic kidneys, horseshoe kidney and pelvic kidney.
Distinguish pseudotumors/ benign space occupying lesions (e.g. prominent column of bertini) from tumours

Captopril Renogram

Determination of the presence of renovascular disorders as a cause of hypertension
Malignant hypertension
Hypertension difficult to control or resistant to medical therapy
Hypertension occurring at extremes of age
Deterioration of renal function during therapy with ACE inhibitors
Deteriorating renal function of no obvious cause

Radionuclide Cystogram

Direct/indirect
Assess active reflux of urine

Liver and Spleen

HEPATOBIILIARY SCINTIGRAM (HIDA SCAN)
Suspected acalculous cholecystitis
Suspected chronic biliary tract disorders
Atresia of the biliary tree (Neonatal jaundice)
Enterogastric reflux

Liver

Hepatic Hemangioma/s
Cirrhosis

Spleen

Assessment for splenunculus or residual splenic tissue post splenectomy

Cerebral Perfusion Imaging

Evaluation of patients with suspected dementia
Pre-surgical localization of epileptic foci
Determine brain death

Radionuclide Cisternography

Investigating suspected communicating hydrocephalus (normal pressure hydrocephalus)
Detect the site and severity of a CSF fistula or leakage
To assess the patency of a shunt or pathway in surgical treatment of hydrocephalus

Dacryoscintigraphy

Determine functional obstruction of lacrimal ducts
Causes include obstruction of the lacrimal excretion system, xerophthalmia, foreign bodies, and drug induced tear overproduction.

Salivary Gland Scintigraphy

Sensitive and valid method for evaluation of the function of the salivary glands.
Relatively safe, well tolerated and easy to perform, and enables an assessment of the function of all major salivary glands.

Infection/Inflammation

Fever of unknown origin (FUO) for localization of the primary site of infection
Assessment of region/s for residual ongoing or occult infection
Assessment of severity and extent of infection
Assessment of response to therapy

Scintimammography

Identifying multicentric, multifocal or bilateral breast cancer in patients with a diagnosis of breast cancer
Breast lump in patient with:
Dense breast
Previous breast biopsy
Previous lumpectomy
Previous radiotherapy in breasts

Venogram

Venoscintigraphy to determine DVT (Deep Vein Thrombosis)
other abnormalities in veins

Cardiovascular Scintigraphy

Myocardial Imaging

Diagnosis of coronary artery disease:
Presence, location (coronary territory) and severity
Assessment of the impact of coronary stenosis on regional perfusion
Distinguish viable hibernating myocardium from scar
Risk assessment and stratification
Post myocardial infarction
Pre-operative for major surgery in patients who may be at risk for coronary events
Monitor treatment effect
Monitor after coronary revascularization
Medical therapy for congestive heart failure or angina
Lifestyle modification

Equilibrium Radionuclide Angiocardiography (ERNA / MUGA)

Determine global and regional measures of ventricular function (primarily LV function)
These measures of ventricular function may include evaluations of ventricular wall motion, ejection fraction (EF), and other parameters of systolic and diastolic function.

Gastrointestinal System

GIT bleed
Meckels Diverticulum
Gastro-Oesophageal transit and reflux in children (Milk scan)
Gastric emptying and transit
Small and large bowel transit

Testicular Scintigraphy

Useful to differentiate the cause of a swollen or painful testicle – distinguish acute testicular torsion from inflammation
<24 hours acute torsion
>24hours late/missed torsion
Epididymitis

Lymphoscintigraphy

Lymphoedema of the limbs
Lymphatic leakage
Lymphangiectasia
Chylous ascites

Radiosynoviothsis

Rheumatoid arthritis • Spondylarthropathy (e.g. reactive or psoriatic arthri-tis) • Other inflammatory joint diseases, Persistent synovial effusion • Haemophilic arthritis • •Persistent effusion after joint prosthesis.
Undifferentiated arthritis /synovitis,.

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