

# When to Refer for Nuclear Medicine

Nuclear Medicine is a sub specialty of diagnostic medical imaging involving the use of radioisotopes. It also provides therapeutic options in some pathological processes. There are applications for Nuclear Medicine in assessing all systems of the body.

The functional information of Nuclear Medicine investigations is enhanced when compared with any previous imaging such as plain films, CT or MRI scans. Patients are encouraged to bring old films when attending for a Nuclear Medicine study. Occasionally, further investigations may be indicated and performed at the time of the study to obtain maximum diagnostic benefit.

Nuclear Medicine procedures are customised to the patient, depending on the clinical indications. Some procedures require special preparation. Consequently, patients are requested to call and receive specific instructions when booking for an appointment.

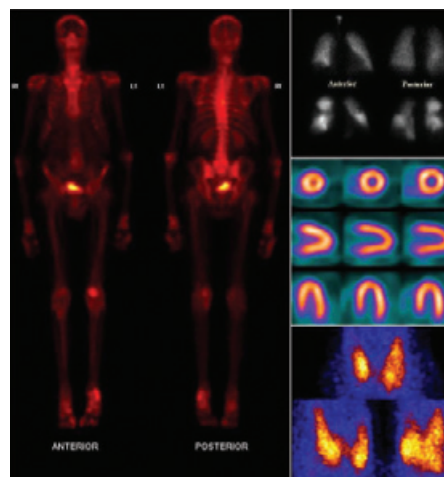


Fig 1. – Anterior and posterior bone scan showing inflammation of the knee and ankle. VQ Cardiac, Lung and Thyroid scans.

The following Queensland X-Ray practices provide Nuclear Medicine Examinations:

#### **Brisbane**

Mater Private Hospital Ph: 07 3840 6200

PET/CT Ph: 07 3840 6222

Greenslopes Private Hospital Ph: 07 3421 0444

Sunnybank Private Hospital Ph: 07 3347 2700

Meadowbrook Practice Ph: 07 3200 2322

#### **Gold Coast**

Southport Practice Ph: 07 5581 0900

#### **Toowoomba**

St Vincent's Private Hospital Ph: 07 4659 4500

St Andrew's Private Hospital Ph: 07 4633 6888

#### **Mackay**

Mater Private Hospital Ph: 07 4965 6200

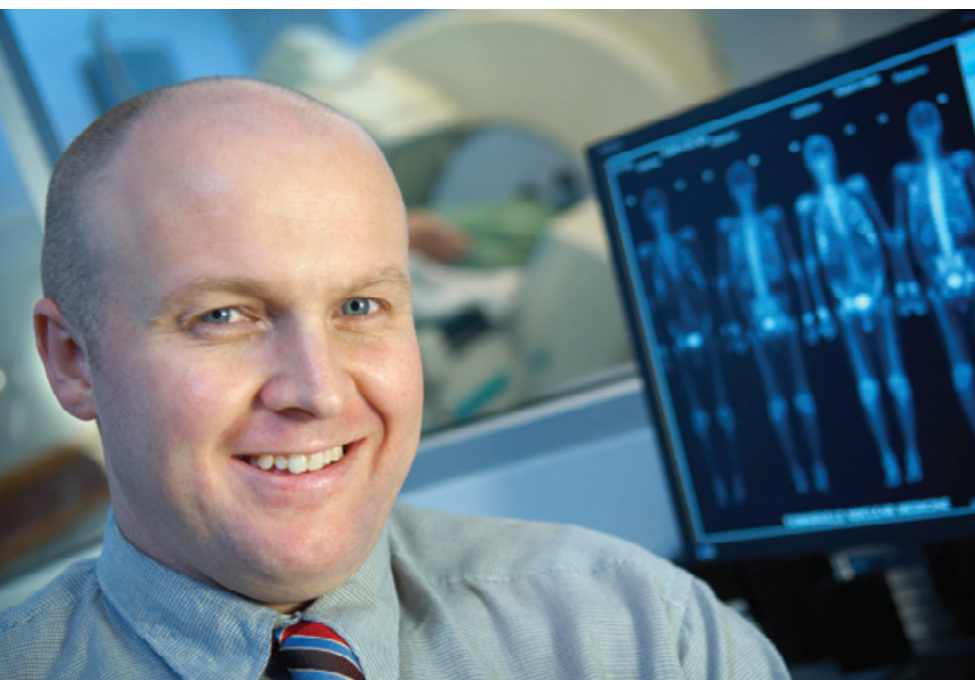
#### **Townsville**

Mater Private Hospital Ph: 07 4759 2800

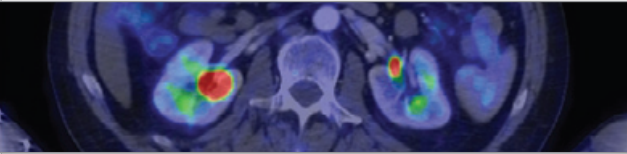
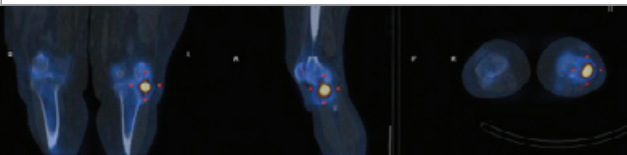

#### **Cairns**

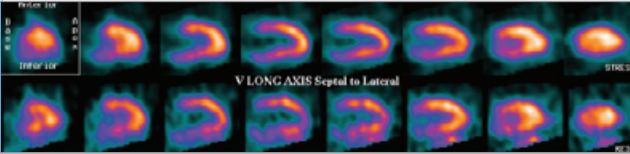
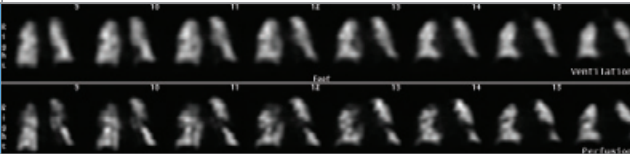
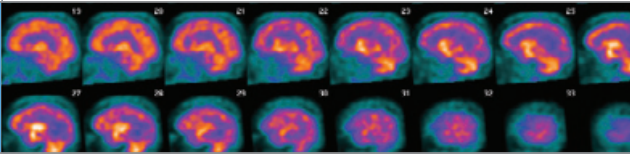
Cairns Private Hospital Ph: 07 4046 7800

For further information please visit our website [www.qldxray.com.au](http://www.qldxray.com.au).

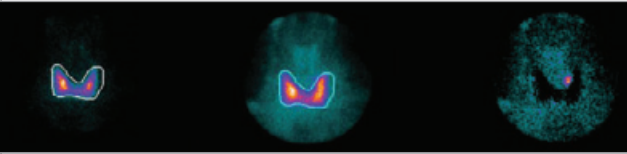


# Nuclear Medicine

Condition/clinical Presentation	Examination To Request
<b>Oncological</b>	
Tumour Localisation	Bone Scan (Primary Bone Cancer, Bony Metastases), Gallium Scan (Lymphoma and Some Adenocarcinomas), PET/CT Scan
Tumour Staging	Bone Scan (Primary Bone Cancer, Prostate, Breast, Lung, Colon, Renal and Thyroid Cancer, Melanoma), Gallium Scan (Lymphoma), PET/CT Scan
Identify Metastatic Sites	Bone Scan, Gallium Scan, PET/CT Scan
Judge Response To Therapy	Bone Scan, Gallium Scan, PET/CT Scan
Sentinel Node Localisation in Breast Cancer/Melanoma	Lymphoscintigraphy
<b>Orthopaedic</b>	
Diagnose Trochanteric Bursitis	Bone Scan
Confirm & Localise Facet Joint Activity	Bone Scan
Identify Occult Bone Trauma (Sports Injuries)	Bone Scan
Diagnose Osteomyelitis	Bone Scan +/-, Gallium Scan +/-, Tc-99m Labelled White Blood Cell Scan +/- (Leukoscan)
Evaluate Arthritic Activity and Extent	Bone Scan
Distinguish Between Prosthetic Joint Infection and Loosening	Bone Scan +/-, Gallium Scan +/-, Tc-99m Labelled White Blood Cell Scan
Detection of Stress Fractures and Shin Splints	Bone Scan
Suspected Occult Fracture eg. scaphoid	Bone Scan
Investigate Elevated Serum ALP	Whole Body Bone Scan
<b>Renal</b>	
Assessment of Possible Vesico Ureteric Reflux	Indirect MCU (Requires bladder control. Not suitable for young children)
Detect Urinary Tract Obstruction	Tc-99m DTPA or Mag3 Scan With Lasix
Diagnose Renovascular Hypertension	Tc-99m DTPA or Mag3 Scan With Captopril
Measure Differential Renal Function	Tc-99m DMSA or Tc-99m DTPA or Mag3 Scan
Detect Renal Transplant Rejection	Tc-99m DTPA or Mag3 Scan
Detect Pyelonephritis	Tc-99m DMSA
Detect Renal Scars	Tc-99m DMSA

Condition/clinical Presentation	Examination To Request
<b>Cardiac</b>	
Investigation of Chest Pain	Myocardial Perfusion Study (Tc-99m Sestamibi/ Tetrofosmin, Thallium)
Risk Stratification of known Coronary Artery Disease	Myocardial Perfusion Study (Tc-99m Sestamibi/ Tetrofosmin, Thallium)
Diagnose Coronary Artery Disease	Myocardial Perfusion Study (Tc-99m Sestamibi/ Tetrofosmin, Thallium)
Monitor Effectiveness of Bypass Surgery/stenting	Myocardial Perfusion Study (Tc-99m Sestamibi/ Tetrofosmin, Thallium), PET/CT Scan
Select Patients for Bypass or Angioplasty/stenting	Myocardial Perfusion Study (Tc-99m Sestamibi/ Tetrofosmin, Thallium), PET/CT Scan
Preoperative Cardiac Risk Assessment of High Risk Patients	Myocardial Perfusion Study (Tc-99m Sestamibi/ Tetrofosmin, Thallium), PET/CT Scan
Monitor Effectiveness of Therapy for Heart Failure	Gated Heart Pool Scan
Identify Right Heart Failure	Gated Heart Pool Scan
Measure Chemotherapy Cardiac Toxicity	Gated Heart Pool Scan
Evaluate Valvular Heart Disease Exercise	Gated Heart Pool Scan
Identify Shunts and Quantify Them	Qp:Qs Shunt Study (Left To Right Shunt)
Diagnose and Localise Acute Heart Attacks	Myocardial Perfusion Study (Tc-99m Sestamibi/ Tetrofosmin, Thallium)
<b>Pulmonary</b>	
Investigation of Pulmonary Hypertension	V/Q Lung Scan
Diagnose Pulmonary Emboli	V/Q Lung Scan
Detect Pulmonary Complications of AIDS	Gallium Scan
Quantify Lung Ventilation and Perfusion for Lung Reduction Surgery	V/Q Lung Scan
Detect Active Pulmonary Alveolitis/Fibrosis/Sarcoid	Gallium Scan, PET/CT Scan
<b>Neurological</b>	
Diagnose Stroke	Cerebral Perfusion Study (Neurolite/Ceretec)
Diagnose Alzheimer's Disease	Cerebral Perfusion Study (Neurolite/Ceretec), PET/CT Scan
Demonstrate Changes in AIDS Dementia	Cerebral Perfusion Study (Neurolite/Ceretec), PET/CT Scan
Evaluate Patients for Carotid Surgery Assessment of Significance of Carotid Stenosis	Cerebral Perfusion Study (Neurolite/Ceretec) with Diamox (Acetazolamide) Challenge
Localise Seizure Foci	Cerebral Perfusion Study (Neurolite/Ceretec), PET/CT Scan
Evaluate Post Concussion Syndrome	Cerebral Perfusion Study (Neurolite/Ceretec)
Diagnose Multi-Infarct Dementia	Cerebral Perfusion Study (Neurolite/Ceretec), PET/CT Scan

## Nuclear Medicine (cont.)

Condition/clinical Presentation	Examination To Request
<b>Other</b>	
Investigation of Thyrotoxicosis (Graves, Toxic Nodule, Subacute Thyroiditis)	Tc-99m Pertechnetate Thyroid Scan
Diagnose Thyroid Disease (Multi-nodular Goitre, Function of Suspicious Thyroid Nodules)	Tc-99m Pertechnetate Thyroid Scan
Detect Acute or Chronic Cholecystitis and Biliary Dyskinesia	HIDA Scan with Fatty Meal or CCK
Detect Acute Gastrointestinal Bleeding	Tc-99m Labelled Red Blood Cell Scan
Diagnose and Assess Inflammatory Bowel Disease	Tc-99m Labelled White Blood Cell Scan
Detect Occult Infections (PUO)	Gallium Scan, PET/CT Scan
Detect Parathyroid Adenoma	Parathyroid Scan
Investigate Epiphora	Dacroscentigraphy
Investigate Epigastric Discomfort and Bloating	Gastric Emptying Study
Investigate Constipation	Colonic Transit Scan
Investigate Limb Swelling/Diagnose Lymphoedema	Lymphoscintigraphy

### Referrers Guide

### Therapeutic Nuclear Medicine

Condition	Treatment
<b>Hyperthyroidism</b>	
Multinodular Goitre	Radionuclide Therapy With Iodine – 131
Graves' Disease	Radionuclide Therapy With Iodine – 131
Autonomous Functioning Thyroid Nodule	Radionuclide Therapy With Iodine – 131
<b>Thyroid Cancer</b>	
Remnant Ablation	Radionuclide Therapy With Iodine – 131
<b>Painful Skeletal Metastases</b>	
Painful Skeletal Metastases From Prostate Cancer	Consultation For Palliative Therapy With Samarium – 153 or Strontium – 89
Painful Skeletal Metastases From Breast Cancer	Consultation For Palliative Therapy With Samarium – 153