

REFERRER GUIDE TO NUCLEAR MEDICINE SERVICES

The Duty Specialist Registrar and Consultant may be contacted directly via the clinic reception on extension 70539.

Completing the Request Card

All sections of the request card should be completed legibly. It must contain clinical information to support the examination requested as the justification process requires all medical exposures to ionizing radiation to carry net benefit to patients. All requests should be signed by a registered medical practitioner who should provide a contact bleep number or telephone number. Requests should include patient details (date of birth, home address, hospital number) together with Consultant name and specialty. The ward location of in-patients should be clearly marked. A land line telephone number for outpatients should be included together with a mobile number if possible.

Please inform the department if a patient has MRSA or any other cause for source isolation, or if a patient is pregnant or breast feeding. All investigations for high risk patients (hepatitis B and C, HIV etc) must be identified as such.

Requests are accepted by fax but investigations will not usually be booked by telephone unless the completed request is already within the department.

In 2011 electronic referral will be possible.

Appointments

Out-patients

These will receive the first available appointment by post together with any special instructions.

In-patients

Every attempt will be made to accommodate in-patient requests for tests such as myocardial perfusion studies, lung scans, renograms and PET/CT studies within 24 hours of request receipt. Ward staff will be informed about any necessary patient preparation.

Reports

Lung scans and scans which impact on acute patient management will be reported on day of data acquisition. Other scans will generally be reported on the following working day. Where technical issues arise or a second opinion is sought then reporting may be delayed.

LABORATORY PROCEDURES

Glomerular filtration rate (GFR)

Indications

1. Serial monitoring of renal function

Patient preparation

None

Red cell mass and plasma volume

Indications

1. Polycythaemia

Patient preparation

None

IMAGING STUDIES

Myocardial perfusion studies

Indications

1. Diagnosis of coronary artery disease particularly in women, patients unable to exercise and those with an abnormal resting ECG
2. To aid in the management of patients with known CAD
 - to determine the likelihood of future coronary events
 - to guide strategies of myocardial revascularization by determining the haemodynamic significance of coronary lesions
 - to assess the adequacy of percutaneous and surgical intervention
3. Detection of viable/hibernating myocardium in patients with heart failure secondary to coronary disease with reference to planned myocardial revascularization.

Myocardial perfusion imaging protocols vary according to patient body mass index (BMI) and equipment availability. Request forms must therefore include information about patient **height** and **weight**, and whether patients are **asthmatic** or suffer from claustrophobia.

Patient preparation

Light breakfast only.

No caffeine containing drinks (eg tea, coffee, cola), food (chocolate) or medication from midnight before the scan as caffeine interferes with the test.

Decaffeinated drinks should also be avoided as these still contain small amounts of caffeine.

Stop dipyridamole and theophylline preparations for 24 hours before the test.

Please contact the Duty Nuclear Medicine Specialist Registrar on extension 70539 or UCLH Medicines Information Service on extension 73012 for further information about drugs to avoid.

MUGA scan

Indications

1. Assessment of left ventricular function before chemotherapy
2. Monitoring cardiac effects of chemotherapy
3. Evaluation of patients with dyspnoea in patients who are poor echocardiography subjects

Patient preparation

None

Lung (V/Q) scan

Indications

1. Diagnosis of pulmonary embolism
2. Assessment of regional ventilation and perfusion

Patient preparation

None but a recent chest X-ray (within 24 hours) must be available on PACS.

Bone scan

Indications:

1. Primary or metastatic tumours
2. Trauma
3. Sport injuries
4. Avascular necrosis
5. Infection
6. Arthritis/facet joint disease
7. Metabolic disorder
8. Assessment of joint prostheses

9. Complex spine surgery

Patient preparation

Good hydration.

In patients with facet joint disease and complex spine surgery SPECT/CT or PET/CT may be performed.

Bone densitometry (DEXA)

Indications

1. Diagnosis and serial assessment of osteoporosis
2. Treatment response

Patient preparation

None. Useful to know of metal implants in hips or spine. Barium or CT studies with contrast performed in 24 hours before test may interfere with data analysis

Dynamic (MAG3) renography

Indications

1. Divided renal function
2. Assessment of outflow obstruction
3. Urinary tract infection
4. Evaluation of renal failure
5. Renal transplant evaluation
6. Captopril test in suspected renovascular hypertension
7. Assessment of urinary bladder

Patient preparation

Good hydration. For reflux studies patient should be toilet trained (circa 3 years of age). For captopril study, ask department for further details.

Renal (DMSA) scan

Indications

1. Assessment of cortical scarring
2. Divided renal function
3. Detection of ectopic kidney

Patient preparation

None

White cell scan

Indications

1. Fever of unknown origin
2. Post-operative patients with suspected abscess
3. Osteomyelitis
4. Infected joint prostheses
5. Suspected inflammatory bowel disease
6. Infected vascular grafts

Patient preparation

None. In some patients an ^{18}F -FDG or ^{68}Ga gallium-DOTATATE PET study may be more appropriate. Contact department to discuss.

Gastrointestinal bleed scan

Indications

1. Evaluation of upper and lower gastrointestinal bleeding.

Patient preparation

None.

Meckels scan

Indications

1. Meckel's diverticulum

Patient preparation

Nil by mouth for 4-6 hours. Infants may require sedation and nursing support. A recent barium examination within 24 hours may obscure a small bleeding site so delay meckels scans until after this.

Gastric emptying study

Indications

1. Suspected gastroparesis in diabetic patients
2. After gastric surgery
3. When taking medication that affects gastric motility

Patient preparation

Nil by mouth for 6 hours. Check patient drugs with INM medical staff – prokinetic drugs such as tricyclic antidepressants and anticholinesterases should be stopped for 2 days prior to study.

Hepatobiliary (HIDA) scan

Indications

1. Acute cholecystitis
2. Obstructive jaundice
3. Detection of biliary leak after surgery or trauma
4. Biliary atresia
5. Duodeno-gastric reflux.

Patient preparation

Nil by mouth for 6 hours.

Brain (DaTSCAN) scan

Indications

1. Differential diagnosis of movement disorders
2. Differential diagnosis of dementia

Patient preparation

Potassium iodide to block thyroid uptake - 2 tablets (120 mg total) to be taken the evening before the ¹²³Iodine DaTSCAN injection and 2 tablets (120 mg total) in the evening of tracer injection. Sedation may be required for agitated patients. Please inform department if you think patient will be unable to co-operate with imaging.

Thyroid scan

Indications

1. Goitre and evaluation of palpable nodules
2. Hyperthyroidism
3. Thyroiditis
4. Differential diagnosis of anterior neck masses
5. As a prelude to radio-iodine therapy in thyrotoxic patients

Patient preparation

Thyroid medication should be stopped prior to tracer injection:

Carbimazole for 2 days

Propylthiouracil for 2 weeks

T3 for 2 weeks

T4/thyroxine for 2 weeks

No shellfish on the day of/day prior to test

¹²³Iodine thyroid scans will not be performed in patients taking amiodorone. ^{99m}

Technetium thyroid scans can be performed in patients taking amiodorone,

however, ensure department aware. Inform department of recent iodine based contrast x-ray studies.

Parathyroid scan

Indications

1. Suspected parathyroid adenoma

Patient preparation

None

MIBG scan

Indications

1. Suspected neuroendocrine tumour eg pheochromocytoma, paraganglioma, neuroblastoma and other neural crest tumours
2. Assessment of adrenal masses
3. As a prelude to MIBG therapy

Patient preparation

Potassium iodide to block thyroid uptake. 2 tablets (120 mg total) to be taken the evening before the ¹²³Iodine MIBG injection and 2 tablets (120 mg total) in the evening of tracer injection. Stop interfering medication, especially over the counter decongestants, labetolol and antidepressants (ask department for list)

Sentinel lymph node detection

Indications

1. Pre-operative localization of the sentinel node in carcinoma breast, colorectal cancer, melanoma, penile and vulval cancer, and other tumours

Surgical team must discuss directly with department

Patient preparation

None

¹⁸F-FDG POSITRON EMISSION TOMOGRAPHY/CT (PET/CT)

Indications in oncology

1. Pre-operative staging in lymphomas, carcinoma lung, oesophageal, colorectal cancer, melanoma and most other tumours.
2. Therapy response monitoring
3. Differential diagnosis of tumour versus infection/inflammation (e.g. solitary pulmonary nodule)
4. Differential diagnosis of tumour recurrence versus fibrosis after treatment
5. Paraneoplastic syndrome assessment.

Indications in Cardiology

1. Detection of viable myocardium in patients with heart failure secondary to CAD

Please note: ¹⁸F-FDG PET imaging for viable myocardium will only be performed where there is a recent pre-existing myocardial perfusion scan showing moderate to severe fixed perfusion defects and no inducible ischaemia.

Indications in Neurology/Psychiatry

1. Differential diagnosis of dementia
2. Focal epilepsy localization

Miscellaneous Indications

1. Infection/abscess
2. Arteritis

Patient preparation for ^{18}F - FDG PET

No food for 6 hours. May drink water. Inform department if patient is diabetic at earliest opportunity

 ^{18}F -FE Choline PET/CT***Indications***

1. Detection of recurrent prostate cancer

Patient preparation

None

 ^{18}F -DOPA PET/CT***Indications***

1. Neuroendocrine tumours and congenital hyperinsulinism

Patient preparation

No food for 6 hours. May drink water. Omit diazoxide, octreotide, glucagons and carbidopa for 2 days prior to tracer injection.

 ^{68}Ga Gallium DOTATATE PET/CT***Indications***

1. Assessment of neuroendocrine tumours (carcinoid, gastroendocrine, etc) that express somatostatin receptors .
2. As a prelude to ^{177}Lu lutetium-DOTATATE therapy.

Patient preparation

None

PET/CT WITH CORONARY ANGIOGRAM / CALCIUM SCORE

We also offer a coronary CT angiography service on the PET-64 slice CT scanner. Generally these scans are combined with myocardial perfusion studies (⁸² Rubidium). CT angiography is of particular benefit in certain clinical scenarios where patients would benefit from non-invasive evaluation of coronary arteries, e.g. pre-operative work-up of aortic aneurysms. All patients should be discussed with Cardiology team at UCLH, in particular Dr Simon Woldman.

PET/CT COMBINED WITH DIAGNOSTIC CT

We offer diagnostic CT (combined with PET) in the INM in special circumstances. Patients with Hodgkin's or High Grade Non Hodgkin's Lymphoma who require both diagnostic CT (with I.V. contrast) and PET-CT may have both examinations on the PET/CT scanner in the INM at the same attendance. This is restricted to patients with newly diagnosed lymphoma at present. Requests should be on a Nuclear Medicine form and should be requested by the UCLH Haematology Consultants\Haematology MDT at UCLH.

NB: Patients with known CT contrast allergy and renal insufficiency are usually contra-indicated for IV contrast. These patients **MUST** be discussed with INM consultants prior to request.

RADIONUCLIDE THERAPIES

¹³¹Iodine therapy for benign thyroid conditions

Indications

1. Hyperthyroidism (Grave's disease or toxic goitre)
2. Euthyroid goitre in selected cases

Patient preparation

Thyroid medications should be stopped prior to therapy administration as below:

Carbimazole for 2 days

Propylthiouracil for 2 weeks

No iodine based contrast x-ray studies for at least 3 weeks before therapy.

¹³¹Iodine MIBG Therapy

Indications:

Treatment of MIBG avid neuroendocrine tumours (Pheochromocytomas, paragangliomas, carcinoids) and neuroblastoma as determined at MDT.

Patient preparation:

1. Liaise with Oncologist and book designated therapy side room.
2. Potassium iodine to block thyroid uptake. 2 tablets (120 mg total/day) to be taken starting 2 days prior to treatment and continuing for a further 5 days (total of 7 days).
3. No over the counter medication such as nasal drops and cough mixtures for 3 days prior to therapy as these may contain medication which interferes with therapy.
4. Stop interfering prescribed medication for 3 days prior to therapy (ask Department for list).

⁸⁹ Strontium Therapy

Indications:

1. Treatment of bone pain due to metastatic malignancy that has involved multiple skeletal sites and has evoked an osteoblastic response on a bone scan
2. Where there is danger of spinal cord compression from vertebral metastases or pathological fracture in the extremities

Patient preparation:

1. Liaise with referring Oncologist.
2. Confirm presence of bone metastases on recent bone scan
3. Haemoglobin should be > 10gm, platelets should be > 200 x 10⁹/L (normal range 130 - 400 x 10⁹/L) and white cell count of > 5 x 10⁹/L (normal range 3.2 – 9.8 x 10⁹/L) at the time of patient selection.
4. Discontinue calcium at least 2 weeks before treatment.
5. Provide INM staff with list of medication either prescribed or over the counter to check for possible interactions

¹⁷⁷ Lutetium DOTATATE therapy

Indications

Treatment of ⁶⁸ gallium DOTATATE avid neuroendocrine tumours and neuroblastomas as determined at MDT.

Patient preparation

1. Liaise with Oncologist and book designated therapy side room
2. Stop octreotide on the day
3. Plan amino acid infusion prior to the treatment. Liaise with Nuclear Medicine Consultant.

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