

Referral Criteria for Nuclear Medicine Procedures

Introduction

This document provides advice for referrers to the Nuclear Medicine Department at Hull & East Yorkshire Hospitals. Valid clinical indications are listed for routine diagnostic and therapeutic procedures. Please contact the Nuclear Medicine Department on 01482 622125 (CHH) or 01482 674781 (HRI) for advice on any procedure or clinical indications not covered by this document.

Authorised Referrers to Nuclear Medicine

Any UK Registered Medical Practitioner can request a Nuclear Medicine procedure. Referrals from non-medical staff will be accepted from previously approved staff. A list of approved non-medical referrers is kept in the nuclear medicine department (document E029)

Referral Process

Referrals to Nuclear Medicine should be by an electronic (Order Comms) request. Paper requests will be accepted when electronic requesting is not available (e.g. referrals from outside of the HEY Trust)

Information Required on Referrals to Nuclear Medicine

It is a legal requirement that sufficient clinical details are provided to allow the radiation exposure from the procedure to be justified by the Nuclear Medicine Practitioner (ARSAC Certificate holder). We also require enough details to allow us to identify the patient. If the request is part of a research project/clinical trial, this must be clearly indicated on the request.

NB: Specific ARSAC approval is required for research/clinical trials.

Please provide the following information about the patient as a minimum:

- Full name
- Address
- Date of birth
- Sex
- HEY number or hospital number
- Hospital and ward for in-patients
- Clinical history
- Clinical question to be answered
- Suggested procedure (e.g. bone scan)
- For female patients : whether they are pregnant or breastfeeding, and date of their last menstrual period.
- Any relevant medication
- Any previous procedures which may interfere with the requested procedure (e.g. any radio-opaque substance, or any previous nuclear medicine procedure)
- For requests for therapy procedures, please indicate if the patient :
 - has a catheter or is incontinent
 - has had previous nuclear medicine therapies
- Any medical or other potential risks to staff
- Any language or communication difficulties
- Any conditions that might make it difficult for the patient to comply with the procedure (e.g. difficulties in lying flat)
- Name of clinical trial/research project (if applicable)

In addition, we are required under the Ionising Radiation (Medical Exposure) Regulations 2000 to be

able to identify the referrer. Your details are provided automatically on electronic requests, from your login details. On paper requests, you **MUST** sign and legibly **PRINT** your name and job title.

We CANNOT legally perform procedures without sufficient details to justify the radiation exposure, and identify the patient and referrer

Incomplete requests will be returned to the referrer and this may lead to a delay appointing the patient

Referrals for Nuclear Medicine Therapy

The referrer is responsible for ensuring the therapy is not contra-indicated, assessing the likelihood of a female patient being pregnant and discussing appropriate contraception if needed (see E021 - Therapeutic Nuclear Medicine Exposures and Pregnancy). Please complete a consent form, ask the patient to sign it, and send it to the Nuclear Medicine Department.

Supplementary Drugs

Some investigations require the administration of other, non-radioactive pharmaceuticals as an essential part of the test. These are specified in the tables below after the relevant referral criteria. Your request for an investigation will be taken as implying agreement to the administration of the specified supplementary drug. If you are unhappy about your patient being given these drugs or you feel they are contraindicated this must be clearly stated on the request card.

All procedures which require intravenous administration of a radiopharmaceutical will involve administration of sodium chloride for parenteral use (0.9% w/v) in order to test the patency of any IV devices and to flush the radiopharmaceutical through the device.

Radiation Dose

The radiation dose to the patient (effective dose) is listed for each diagnostic procedure. These are based on the ARSAC notes for guidance (www.arsac.org.uk Jan 2016) and assume an administered activity equal to the ARSAC diagnostic reference level. The administered activity may be altered according to allow for body habitus, pregnancy, scan-type, etc and in these cases the actual effective dose received by the patient may differ from that stated.

In addition, the Nuclear Medicine department may add low-dose CT imaging to the requested procedure when it can contribute to the diagnosis. This will increase the stated effective dose by up to approximately 1.5 mSv

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Clinical Indications for Diagnostic Imaging Studies

Bone Scan – Tc99m Phosphonates/Phosphates

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Known or suspected primary or secondary bone malignancy ^{1a,3a}	None	2.9 - 3.9
Recent trauma – assessment for occult fracture ^{1a}	None	2.9 - 3.9
Suspected osteomyelitis/septic arthritis ^{1a,3a}	None	2.9 - 3.9
Avascular necrosis and Perthes disease ^{1a,3a}	None	2.9 - 3.9
Evaluation of Arthropathies and Arthritides ^{1a,3a}	None	2.9 - 3.9
Reflex sympathetic dystrophy ^{1a,3a}	None	2.9 - 3.9
Bone infarcts ^{1a}	None	2.9 - 3.9
Bone graft viability ^{1a}	None	2.9 - 3.9
Distribution of osteoblastic activity prior to radionuclide therapy for bone pain ^{1a,3a}	None	2.9 - 3.9
Unexplained bone pain ^{1a}	None	2.9 - 3.9
Monitoring disease progression and response to chemo or radiotherapy of bone metastases (>6 months after treatment) ^{3a}	None	2.9 - 3.9
Benign bone tumours ^{3a}	None	2.9 - 3.9
Stress fractures ^{1a,3a}	None	2.9 - 3.9
Non accidental injury ^{3a,3b}	None	2.9 - 3.9
Complications of fractures and therapy ^{3a}	None	2.9 - 3.9
Bone scintigraphy guided surgery (e.g. Osteoid osteoma) ^{3b}	None	2.9 - 3.9
Bone dysplasia ^{3a}	None	2.9 - 3.9
Investigation of children with a limp/backache/ or refusing to stand/use one limb ^{3a,3b}	None	2.9 - 3.9
Pyrexia of unknown origin (Consider PET/CT first)	None	2.9 - 3.9
Suspected Plasmacytoma/Myeloma - only if negative skeletal survey performed (Consider PET/CT first)	None	2.9 - 3.9
Known or suspected metabolic disorders (such as Paget's disease) ^{3a}	None	2.9 - 3.9
Possible loose/infection prosthesis - if greater than 1 year since operation ^{3a}	None	2.9 - 3.9
Assessment of Complications related to Osteoporosis ^{3a}	None	2.9 - 3.9

Bone Marrow Imaging – Tc99m Colloid

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Possible loose/infected prosthesis ^{3a}	None	3.6
Ostoemyelitis ^{1a}	None	3.6

Myocardial Perfusion Imaging - Tl201, Tc99m Sestamibi, or Tc99m Tetrofosmin

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Assess the presence and degree of coronary obstruction in patients with known or suspected coronary artery disease ^{1b,5a,6a,6b}	Adenosine, Dobutamine, GTN, Dipyridamole. In addition we may administer any pharmaceutical considered necessary to mitigate the effects of the agents listed above	6 – 18
To determine the likelihood of future events for patients with known coronary artery disease ^{1b,5a}		6 – 18
To guide myocardial revascularisation by determining the haemodynamic significance of coronary lesions ^{1b,5a}		6 – 18
To assess the adequacy of percutaneous and surgical revascularisation ^{1b,5a,6a,6b}		6 – 18
To assess myocardial viability, particularly with reference to planned myocardial revascularisation ^{1b,5a}		6 – 18
Assessment of the haemodynamic significance of known or suspected anomalous arteries and muscle bridging		6 – 18
Assessment of the haemodynamic significance of coronary artery disease in Kawasaki's syndrome/other anatomical and functional abnormalities		6 – 18
Risk assessment in asymptomatic patients with moderate to high risk factors ^{5a}		6 – 18
Risk assessment for non-cardiac surgery ^{1b,5a}		6 – 18
Assessment of the extent of myocardial scarring and/or ischaemia ^{6c}		6 – 18
Assessment of the presence, extent and severity of endothelial dysfunction		6 – 18

Radionuclide Ventriculography - Tc99m Labelled Erythrocytes

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Assessment of left and/or right global ventricular systolic function ^{1b}	Stannous Agent	5.6
Assessment of regional wall motion ^{1b}	Stannous Agent	5.6
Evaluation of cardiac function in patients undergoing chemotherapy ^{1b} or Herceptin	Stannous Agent	5.6
Pre-surgical assessment of ventricular function prior to non-cardiac surgery	Stannous Agent	5.6
Assessment of ventricular function in patients with valvular stenosis and/or insufficiency ^{1b}	Stannous Agent	5.6
Serial assessment of ventricular function in patients treated with agents known to cause cardiac dysfunction	Stannous Agent	5.6
Assessment of ejection fraction in people who cannot be imaged by any other modality	Stannous Agent	5.6

Cardiac Amyloidosis Imaging - Tc99m Labelled DPD

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Clinical suspicion of amyloid involving the heart ⁷	Tc-99m DPD	6.6

MIBG for Cardiology I123- MIBG

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Assessment of cardiac sympathetic innervation	Lugol's Solution / Potassium Iodide	4.8
Differentiation of Parkinsonian syndromes		(if thyroid blocked)

Ventilation/Perfusion Lung Scan – Tc99m MAA and Tc99m DTPA

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Suspected In-Patient Acute Pulmonary Embolism ^{1c}	None	2.3
Suspected Out-Patient Pulmonary Embolism ^{1c}	None	2.3
To monitor the degree of resolution of change in ventilation and perfusion following an episode of pulmonary emboli ^{1c}	None	2.3
Pre-operative assessment eg: lung volume reduction, bronchial carcinoma ^{1c}	None	2.3
Regional Pulmonary function ^{1c}	None	2.3
For investigation of Pulmonary Hypertension ^{1c}	None	2.3

Other Requirements: All patients with suspected pulmonary embolism must have either a recent chest radiograph within 24 hours or be sent for a chest radiograph immediately after the examination.

Pulmonary Aspiration Scan – Tc99m nanocolloid

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Investigating gastro-oesophageal and laryngopharyngeal reflux disease ⁹	None	0.9

Renal Imaging – Tc99m DMSA

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Renal scarring ^{1d,3c}	None	0.7
Pyelonephritis ^{1d,3c}	None	0.7
Assessment of the Horseshoe, solitary or ectopic kidney ^{1d,3c}	None	0.7
Localisation of the poor or very poorly functioning kidney ^{1d}	None	0.7
Confirmation of non-functioning multi-cystic kidney ^{3c}	None	0.7
Assessment of renal mass lesion ^{1d}	None	0.7
Assessment in paediatric urinary tract infection ^{6d}	None	0.7
Assessment of split renal function as a guide to surgery ^{1d}	None	0.7
Pre transplant donor assessment	None	0.7

Renography – Tc99m MAG3

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Suspected obstruction ^{2a}	Furosemide	0.7
Assessment of dilated collecting system as a cause of back pain ^{1e}		0.7
Pre-transplant donor assessment ^{2b}		0.7
Post surgical assessment of a previously obstructed system ^{1e,2a}		0.7
Assessment of Hydronephrosis ^{1e, 2a}		0.7
Assessment of reflux ^{1e,}	None	0.7
Assessment of renal transplant ^{2b}	None	0.7
Assessment of split renal function ^{2a}	None	0.7

In patients with very poor renal function please indicate the dose of Furosemide required to achieve diuresis.

Gastric Emptying and Small Bowel transit – Tc99m Labelled Meal

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Nausea, vomiting, upper abdominal discomfort, bloating, chronic aspiration after eating ^{1f}	None	0.3
Suspected gastroparesis ^{1f,2c}	None	0.3
Suspected delayed small bowel transit ^{1f}	None	0.3
Poor diabetic control ^{2c}	None	0.3
Gastroesophageal reflux ^{2c}	None	0.3
Assessing response to therapy for previously documented motility disturbances ^{2c}	None	0.3

Meckel's Diverticulum Imaging - Tc99m pertechnetate

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Suspected Meckel's Diverticulum ^{1g}	Ranitidine	5.2

Gastro-Intestinal Bleeding Imaging - Tc99m labelled Erythrocytes

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Acute GI bleed assessment ^{1h}	Stannous Agent	2.8

Liver and Spleen Imaging - Tc99m-nanocolloid

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
To determine the size and shape of the liver and spleen ^{1u} For suspected focal nodular hyperplasia of the liver ^{1u} To assess the function of the reticuloendothelial system ^{1u}	None	0.7-1.8
Liver blood pool imaging for cavernous hemangiomas of the liver ^{1u}	None	0.7-1.8
Hepatic perfusion imaging ^{1u}	None	0.7-1.8
Splenic imaging to detect functional splenic tissue ^{1u}	None	0.7-1.8

Protein Loss Estimation - Tc99m HSA

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
For the detection of gastrointestinal protein loss ⁸	None	4.5

Indium Labelled Leucocyte Scan – In111 labelled Leucocytes

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
To detect sites of infection/inflammation in patients with granulocytosis and fever of unknown origin for more than 2 weeks ¹ⁱ (Consider PET/CT first)	None	7.2
To localise an unknown source of sepsis and to detect additional sites of infection in patients with persistent or recurrent fever and a known infection site for more than 2 weeks ¹ⁱ (Consider PET/CT first)	None	7.2
To survey for site(s) of abscess or infection in a febrile post-op patient without localising signs or symptoms ¹ⁱ (Consider PET/CT first)	None	7.2
To detect site(s) and extent of inflammatory Bowel Disease ¹ⁱ	None	7.2
Osteomyelitis/infected prosthesis ¹ⁱ	None	7.2
To detect mycotic aneurysms, vascular graft and shunt infections ¹ⁱ . (Consider PET/CT first)	None	7.2

Studies for investigation of osteomyelitis/infected prosthesis may be combined with bone marrow imaging.

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Tc99m Labelled Leucocyte Scan – Tc99m HMPAO labelled Leucocytes

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
To detect suspected sites of acute inflammation/infection in the febrile patient with or without localising signs or symptoms for less than 2 weeks ^{1j} (Consider PET/CT first)	None	2.2
To detect and determine the extent of inflammatory or ischaemic bowel disease ^{1j}	None	2.2
To detect and follow-up musculoskeletal infection such as septic arthritis and osteomyelitis ^{1j}	None	2.2

Gallium - Ga67

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Pyrexia unknown origin ^{1k} (Consider PET/CT first)	Picolax / Senna	15
Detection of pulmonary and mediastinal inflammation/infection ^{1k} (Consider PET/CT first)		15
Evaluation and follow-up of active lymphocytic or granulomatous inflammatory processes such as sarcoidosis or tuberculosis ^{1k}	Picolax / Senna	15
Diagnosing osteomyelitis and/or disk space infection. Ga-67 is preferred over labelled leucocytes for disk space infection ^{1k}	Picolax / Senna	15
Diagnosis and follow-up of medical treatment of retroperitoneal fibrosis ^{1k}	Picolax / Senna	15
Evaluation and follow-up of drug-induced pulmonary toxicity (e.g. Bleomycin, Amiodarone) ^{1k}	None	15
Lymphoma (Hodgkin's and Non-Hodgkin's) ^{3d} (Consider PET/CT first)	Picolax / Senna	15
HIV assessment	Picolax / Senna	15
Malignant Otitis Externa assessment	None	15

Thyroid imaging and uptake with Technetium – Tc99m pertechnetate

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Assessment of functionality of thyroid nodules ^{1l}	None	1
Assessment of goitre including hyperthyroid goitre ^{1l}	None	1
Assessment of uptake function prior to radio-iodine treatment ^{1l}	None	1
Assessment of suspected thyroiditis ^{1l}	None	1
Assessment of neonatal hypothyroidism ^{1l}	None	1

Thyroid/Whole Body imaging with Iodine-123 – I123 sodium iodide

Indication <small>(with references where appropriate)</small>	Supplementary	Effective Dose
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	Drugs	(mSv)
Assessment of retrosternal thyroid ^{1m}	None	6.1
Assessment of ectopic thyroid tissue ^{1m}	None	6.1
To determine the presence and extent of residual functioning thyroid tissue and the presence and location of functioning thyroid cancer ^{1m}	Thyrogen	7.8 (after ablation)
As part of Parathyroid Localisation Study (see separate section)	None	See below

Thyroid/Whole Body imaging with Iodine-131 – I131 sodium iodide

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
To determine the presence and extent of residual functioning thyroid tissue and the presence and location of functioning thyroid cancer ^{1m}	Thyrogen	Normally this is done post ablation therapy so no additional dose

Parathyroid Localisation Subtraction Technique – Tc99m SestaMIBI and I123 Sodium Iodide

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Localisation of parathyroid adenoma prior to surgical removal of the gland(s) ¹ⁿ	None	NM 8.1 (^{99m} Tc) and 6.1 (¹²³ I) + 0.9 for SPECT/CT

HIDA Scan Tc99m HIDA

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Functional assessment of the gall bladder (NEEDS NORMAL ULTRASOUND FIRST) ¹⁰	Sinacalide / Fatty meal	2.4
Acute/chronic cholecystitis ¹⁰	None	2.4
Evaluation of common bile duct obstruction ¹⁰ (evaluation of sphincter of Oddi dysfunction)	Sinacalide	2.4
Detection of bile extravasation / leak ¹⁰	None	2.4
Evaluation of congenital abnormalities of the biliary tree including biliary atresia ¹⁰	Phenobarbitone	2.4

Octreotide Scan – In111 Octreotide

Indication <small>(with references where appropriate)</small>	Supplementary	Effective Dose
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	Drugs	(mSv)
Assessment of neuroendocrine tumour (detection, metastases, recurrence) ^{1p,3}	Senna	12
Determination of somatostatin-receptor status prior to proposed therapy ^{1p,3}	Senna	12
Selection of patients for PRR Therapy	Senna	12

Tc^{99m} labelled Octreotide scan – ^{99m}Tc Tektrotyd

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Assessment of neuroendocrine tumour (detection, metastases, recurrence) ^{1p,3}	Senna	3.7
Determination of somatostatin-receptor status prior to proposed therapy ^{1p,3}	Senna	3.7
Selection of patients for PRR Therapy	Senna	3.7

MIBG for Oncology I123- MIBG

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Neuroendocrine tumour (e.g. pheochromocytoma) detection, staging and localisation ^{1q,3e}	Lugol's Solution / Potassium Iodide	5.2 (if thyroid blocked)
Adrenal medulla hyperplasia ^{3e}	Lugol's Solution / Potassium Iodide	5.2 (if thyroid blocked)
Assessment of disease pre- and post- ¹³¹ I MIBG Therapy ^{3e}	Lugol's Solution / Potassium Iodide	5.2 (if thyroid blocked)

Lymphatic Imaging – Tc99m Colloid

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Sentinel Node localisation ^{3f}	None	0.02 – 0.18
Lymphoedema assessment ^{2d}	None	0.09

Thallium Brain Imaging – Tl201 as thallos chloride

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Assessment of recurrent tumour/radiation fibrosis ¹⁰	None	26

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DaTSCAN Imaging ¹²³I Ioflupane

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Differentiation between Essential Tremor/Drug Induced Parkinson's Disease, and Parkinsonian syndromes ^{3g}	Lugol's Solution / Potassium Iodide	4.6
Assessment of the severity and progression of Parkinsonian syndromes ^{3g}	Lugol's Solution / Potassium Iodide	4.6
Differentiation between Alzheimer's Disease and Dementia With Lewy Bodies/Parkinsonian Dementia ^{3g}	Lugol's Solution / Potassium Iodide	4.6

HMPAO (Exametazime) Brain Imaging - Tc99m HMPAO

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Detection and evaluation of acute and chronic cerebrovascular disease ^{1r,3h}	None	7
Evaluation of patients with suspected dementia ^{1r,3h}	None	7
Presurgical localization of epileptic foci ^{1r,3h}	None	7
Evaluation of suspected brain trauma ^{1r,3h}	None	7
Evaluation of suspected inflammation ^{3h}	None	7
Evaluation of suspected brain death ^{3h}	None	7

Clinical Indications for Diagnostic Non-Imaging Studies

Glomerular Filtration Rate (GFR) – Tc99m DTPA

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Measurement of Glomerular Filtration Rate (GFR) ^{2e}	None	0.05

Red Cell Volume Cr51 Labelled Erythrocytes

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Measurement of Red Cell Volume ⁴	None	0.1

Bile Salt Malabsorption Se75 SeHCAT

Indication <small>(with references where appropriate)</small>	Supplementary Drugs	Effective Dose (mSv)
Investigation of Bile Salt Absorption ^{4,6e}	None	0.3

Clinical Indications for Radionuclide Therapy

Iodine-131 Therapy – I131 Sodium Iodide

Indication (with references where appropriate)
Hyperthyroidism (Graves' disease, toxic multinodular goitre, solitary toxic thyroid nodule) ^{1s,3f}
Non toxic multinodular/diffuse goitre ^{1s,3f}
Post-operative ablation of benign thyroid remnant after thyroidectomy ^{1s,3j}
Therapy of residual thyroid cancer, local and distant metastases ^{1s,3j}

³²Phosphorus Therapy

Indication (with references where appropriate)
Polycythaemia rubra vera ^{3k}
Essential Thrombocythaemia ^{3k}

Strontium-89 Therapy

Indication (with references where appropriate)
Treatment of bone pain due to skeletal metastases involving more than one site associated with an osteoblastic response on bone scintigraphy ^{1t,3l}
Patient should have full blood count and serum creatinine within 3 weeks prior to the therapy

Samarium-153 Therapy

Indication (with references where appropriate)
Treatment of bone pain due to skeletal metastases involving more than one site associated with an osteoblastic response on bone scintigraphy ^{1t,3l}
Patient should have full blood count and serum creatinine within 3 weeks prior to the therapy

Radium-223 Therapy

Indication (with references where appropriate)
Treatment of bone pain due to skeletal metastases involving more than one site associated with castration resistant prostate cancer ^{6f}
Patient should have full blood count and serum creatinine within 3 weeks prior to the therapy

References

1. Society of Nuclear Medicine Procedure Guidelines (<http://www.snm.org>)
 - a. Society of Nuclear Medicine Procedure Guideline for Bone Scintigraphy version 3.0 approved June 20, 2003.
 - b. ACR-SNM-SPR Practice Guideline for the Performance of Cardiac Scintigraphy.
 - c. Society of Nuclear Medicine Procedure Standard for Lung Scintigraphy 4.0 Parker *et al.* Journal of Nuclear Medicine Technology. Vol40, No. 1 March 2012.
 - d. Society of Nuclear Medicine Procedure Guideline for Renal Cortical Scintigraphy in Children. Version 3.0, Society of Nuclear Medicine Procedure Guidelines Manual August 2003.
 - e. ACR-SPR-SNM Practice Guideline for the Performance of Adult and Pediatric Radionuclide Cystography. Practice Guideline Revised 2010 Society of Nuclear Medicine Procedure Guidelines.
 - f. The SNMMI and EANM Practice Guideline for Small-Bowel and Colon Transit 1.0 The Journal of Nuclear Medicine Vol 54. No 11 Nov 2013
 - g. SNMMI and EANM Practice Guideline for Meckel Diverticulum Scintigraphy 2.0 Journal of Nuclear Medicine Technology. Vol 42. No. 3 Sept 2014
 - h. The SNMMI Procedure Standard/EANM Practice Guideline for Gastrointestinal Bleeding Scintigraphy 2.0, 3 Dec 2014
 - i. Society of Nuclear Medicine Procedure Guideline for ¹¹¹In-Leukocyte Scintigraphy for Suspected Infection/Inflammation. Version 3.0, approved June 2, 2004.
 - j. Society of Nuclear Medicine Procedure Guideline for ^{99m}Tc Exametazime (HMPAO)-Labelled Leukocyte Scintigraphy for Suspected Infection/Inflammation. Version 3.0 approved June 2, 2004.
 - k. Society of Nuclear Medicine Procedure Guideline for Gallium Scintigraphy in Inflammation, Version 3.0 approved June 2, 2004.
 - l. Society of Nuclear Medicine Procedure Guideline for Thyroid Scintigraphy V3.0 approved September 10, 2006
 - m. ACR-SNM-SPR Practice Guideline for the Performance of Thyroid Scintigraphy and Uptake Measurements. Revised 2009 (Res.17)
 - n. SNM Practice Guideline for Parathyroid Scintigraphy 4.0 Greenspan *et al* Feb 2012.
 - o. SNM Practice Guideline for Hepatobiliary Scintigraphy 4.0 Tulchinsky *et al* Journal of Nuclear Medicine Technology. Vol 38. No 4 December 2010.
 - p. The SNM Practice Guideline for Somatostatin Receptor Scintigraphy 2.0 Balon H R *et al* Somatostatin receptor scintigraphy 2011 pp 317-324.
 - q. ¹³¹I/¹²³I-Metaiodobenzylguanidine (mIBG) scintigraphy : procedure guidelines for tumour imaging. Bombardieri E *et al* Eur J Nucl Med Mol Imaging (2010) 37:2436-2446
 - r. Procedure Guideline for Brain Perfusion SPECT using ^{99m}Tc Radiopharmaceuticals 3.0 Juni JE *et al* SNM Procedure Guideline 2009.
 - s. The SNM Practice Guideline for Therapy of Thyroid Disease with ¹³¹I 3.0 Journal of Nuclear Medicine, published on July 11, 2012
 - t. Society of Nuclear Medicine Procedure Guideline for Palliative Treatment of Painful Bone Metastases Version 3.0 approved Jan25, 2003
 - u. Society of Nuclear Medicine Procedure Guideline for Hepatic and Splenic Imaging 3.0, Royal HD *et al.* 2003

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2. British Nuclear Medicine Society Procedure Guidelines (<http://www.bnms.org.uk>)
 - a. Dynamic Renal Radionuclide Studies (Renography) Clinical Guidelines BNMS
 - b. Dubovsky EV, Russell CD, Bischof-Delaloye A, Bubeck B, Chaiwatanarat T, Hilson AJ, Rutland M, Oie HY, Sfakianakis GN, Taylor A. Report of the Radionuclides in Nephrourology Committee for the evaluation of transplanted kidney (review of technique) Seminars in Nuclear Medicine 24:175-188. (1999)
 - c. Guideline for Gastric Emptying – BNMS Version 1.2 (09.12.14) for review 2017
 - d. Lymphoscintigraphy – BNMS website May 2016
 - e. Guidelines for the Measurement of Glomerular Filtration Rate using Plasma Sampling – BNMS website May 2016

3. European Association of Nuclear Medicine (www.eanm.org/)
 - a. Bone Scintigraphy : procedure guidelines for tumour imaging
 - b. Guidelines for paediatric bone scanning with ^{99m}Tc-labelled radiopharmaceuticals and ¹⁸F-fluoride. Stauss J, Hahn K, Mann M, De Palma D Eur J Nucl Med Mol Imaging. Published online 11 June 2010.
 - c. Guidelines on ^{99m}Tc-DMSA Scintigraphy in Children. Revised Guidelines on ^{99m}Tc-DMSA Scintigraphy in Children (2009)
 - d. ⁶⁷Ga Scintigraphy. Procedure Guidelines for Tumour Imaging Bombardieri E *et al* 2003. **EANM Disclaimer**
Authoritative source: Dr. Richard Wolf, LL.M. Partner (legal advisor)
Please note that this guideline has not been updated since 2003 and, therefore, may not reflect the current knowledge and practice in the field of oncology. EANM is providing this guideline on an 'as is' basis for general information purposes only and does not accept any responsibility for the accuracy, completeness, currency, relevance, reliability or suitability of the information contained therein.
 - e. EANM 2012 guidelines for radionuclide imaging of pheochromocytoma and paraganglioma. Eur J Nucl Med Mol Imaging (2012)39:1977-1995.
 - f. EANM-EORTC general recommendations for sentinel node diagnostics in melanoma. Eur J Nucl Med Mol Imaging 2009.
 - g. EANM procedure guidelines for brain neurotransmission SPECT using ¹²³I-labelled dopamine transporter ligands, version 2 Darcourt J *et al* Eur J Nucl Med Mol Imaging 2009.
 - h. EANM procedure guideline for brain perfusion SPECT using ^{99m}Tc-labelled radiopharmaceuticals, version 2 Kapucu OL *et al* Eur J Nucl Med Mol Imaging 2009
 - i. EANM procedure guidelines for therapy of benign thyroid disease. Stokkel MPM *et al* 2010 Eur J Nucl Med Mol Imaging 37: 2218-2228
 - j. Guidelines for radioactive therapy of differentiated thyroid cancer. Luster M *et al* 2008 Eur J Nucl Med Mol Imaging
 - k. EANM procedure guideline for ³²P phosphate treatment of myeloproliferative diseases. Tennvall J *et al* Eur J Nucl Med Mol Imaging (2007) 34:1324-1327
 - l. EANM procedure guideline for treatment of refractory metastatic bone pain. Bodei L *et al* Eur J Nucl Med Mol Imaging (2008)

4. ARSAC Notes for Guidance on the Clinical Administration of Radiopharmaceuticals and Use of Sealed Radioactive Sources. January 2016 (<http://www.arsac.org.uk>)

5. The American Society of Nuclear Cardiology (<http://www.asnc.org>)
 - a. 'Appropriate Use Criteria for Cardiac Radionuclide Imaging' Journal of the American College of Cardiology. Vol53, No.23, 2009.

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Referral Criteria

SOP Code: E008

6. The National Institute for Health and Clinical Excellence (<http://guidance.nice.org.uk>)
 - a. Myocardial perfusion scintigraphy for the diagnosis and management of angina and myocardial infarction TA73
 - b. Stable Angina Management CG126
 - c. Chest pain of recent onset :assessment and diagnosis CG95
 - d. Urinary tract infection in under 16s: diagnosis and management. NICE guidelines [CG54].
 - e. SeHCAT (tauroselcholic [75 selenium] acid) for the investigation of diarrhoea due to bile acid malabsorption in people with diarrhoea-predominant irritable bowel syndrome (IBS-D) or Crohn's disease without ileal resection. Nov 2012 NICE diagnostics guidance [DG7]
 - f. Ra-223 dichloride for treating hormone-relapsed prostate cancer with bone metastase. NICE technology appraisal guidance [TA376] Published date 27Jan 2016

7. 'Role of 99mTc-DPD Scintigraphy in Diagnosis and Prognosis of Hereditary Transthyretin-Related Cardiac Amyloidosis' Rapezzi C *et al* Cardiovascular Imaging, 2011, Volume 4, Issue 6, pages 659 – 670.
8. 'Protein-losing enteropathy: diagnosis with (99m) Tc-labeled human serum albumin scintigraphy' Chiu NT *et al* Radiology 2001 Apr 219(1): 86-90.
9. 'Differences between scintigraphic reflux studies in gastrointestinal reflux disease and laryngopharyngeal reflux disease and correlation with symptoms' Falk M *et al* Nuclear Medicine Communications, June 2015, Volume 36 Number 6 pages 625 – 630.
10. 'Thallium-210 SPECT Imaging of Brain Tumours : Methods and Results' Kim *et al*. Journal of Nuclear Medicine, 1990; 31, pages 965 – 969.

CHANGE RECORD

Date	Author	Nature of Change	Reference
October 2011	G Wright	Major restructuring and simplification.	3.0
April 2012	G Wright	Updated to allow referrals from non-medical staff Changed wording to indicate Requests should be electronic when electronic system available	3.1
February 2017	G Wright/H Gill	References updated and referral criteria checked with ARSAC licence holders.	3.2