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Introduction

This document brings together the agreed clinical protocols and indications for PET/CT scanning in Scotland.

Each of the protocols has been developed by a group of experts drawn from across the three regional cancer networks.

All of the protocols have been endorsed by the erstwhile National PET Advisory Group and endorsed by the three regional cancer network advisory groups.

A flowchart is attached at annex A outlining the process for PET Clinical Protocol development, approval and distribution to the service.

The estimated number of scans for NHS Scotland is based on utilisation of scanners in NHSScotland for 2011/12.

It is a good practice if at all possible that all PET-CT examinations should only be requested after the cases have been discussed at the appropriate multi-disciplinary meeting.

Should a clinician wish to request a PET/CT scan for conditions other than those set out here, they are able to do this. They should discuss the request with the relevant PET/CT clinical lead in the first instance.
Protocol for use of PET/CT scanning in the management of patients with colorectal cancer

Positron Emission Tomography using radio-labelled glucose (\(^{18}\)FDG) has been shown in many studies to be more accurate than standard staging investigations using CT scanning for the detection of occult metastatic disease. Recent evidence (HTA, 2007; Fletcher et al, 2008) confirmed earlier findings that there were cost effective indications for the use of PET/CT scanning in the management of colorectal cancer.

Indications for the use of PET scanning

All patients with metastatic colorectal cancer (mCRC) being considered for treatments with surgery or non-surgical therapy (chemotherapy and / or radiotherapy) are discussed and imaging reviewed at a colorectal cancer multidisciplinary team (MDT) meeting. A PET/CT scan is only appropriate on an individual named patient basis where there is some indication that it would change their management.

1. Patients with apparently organ-restricted liver or lung metastases (either at primary presentation or during follow-up) who are being considered for resection. A PET/CT scan should be considered prior to the administration of cytoreductive chemotherapy. The identification of occult metastatic disease prior to resection or chemotherapy may render resection inappropriate or may alter a patient’s management.

2. PET/CT is recommended in the assessment of patients with a solitary pulmonary nodule (a minimum of 8mm).

3. PET/CT in addition to conventional imaging is beneficial for evaluating recurrence if:
   a) conventional imaging is inconclusive
   b) CEA levels are raised and conventional imaging is normal
   c) local relapse is suspected clinically.

Estimated number of scans for NHS Scotland = 515

References


Protocol for the use of PET/CT scanning in the management of gynaecological cancer

This protocol is based on best available evidence and has been produced with the assistance of experts from across NHSScotland. The PET Advisory Group and the three Regional Cancer Advisory Groups have endorsed this protocol.

Indications for PET/CT in Cervical Cancer

In the first instance, the focus should be on where a PET/CT scan would/could change management/treatment plans. A PET/CT scan is only appropriate on an individual named patient basis where there was some indication that it would change management and the role of the scan will be subject to detailed audit.

1. Proposed Radical Surgery for Cervix cancer

Following staging MR of pelvis and lower abdomen, cases with stage 1B or 2A cervix cancer (greater than 2 cm) who are being considered for radical hysterectomy and pelvic lymph node dissection (RHND) are advised to undergo PET/CT to exclude any occult metastases.

2. Concomitant Chemo-Radiation Therapy (CCRT) for localised disease.

Cases being selected for CCRT are recommended to undergo PET/CT because of the significant risk of extra pelvic disease which if detected it will change patient management.

2. Exenteration for relapse

When exenteration is proposed for locally relapsed disease PET/CT is recommended to identify those patients who are not suitable surgical candidates.

3. Pelvic relapse after RHND

Women with pelvic relapse after surgery who are being considered for CCRT are recommended to undergo PET/CT for restaging.

Estimated number of scans for NHS Scotland = 217

References


Protocol for the use of PET/CT scanning in the management of Head and Neck Cancer

This protocol has been produced with the assistance of experts from across NHSScotland. The suggested indications represent current expert opinion on the best use of PET/CT in this numerically small but clinically complex group of patients.

The PET Advisory Group and the three Regional Cancer Advisory Groups have endorsed this protocol.

**Indications for PET/CT in Head and Neck Cancer.**

In the first instance, the focus should be on where a PET/CT scan would/could change management/treatment plans. A PET/CT scan is only appropriate on an individual named patient basis where there is some indication that it would change management and the role of the scan will be subject to detailed audit.

1. **Unknown Primary Tumour Site**
   
   Patients with metastatic cervical lymphadenopathy proven on biopsy or FNA and with no primary found on clinical examination or where CT/MRI are negative/equivocal. It is desirable to perform PET prior to biopsy of suspected but unproven primary sites.

   To expedite this process, the referring clinician can indicate on the request card that, if conventional imaging does not identify a primary site, direct referral for PET/CT by the reporting specialist head and neck radiologist is appropriate.

2. **Disease Recurrence Post Treatment**

   Patients with clinically suspected disease recurrence post treatment in whom CT/MRI results are negative/equivocal.

3. **Complex Staging Cases**

   A PET/CT scan may be required in some cases of advanced disease where complex management decisions need to be made. Such patients must be referred through a multidisciplinary team process.

4. **Thyroid Cancer Recurrence**

   - Treated differentiated thyroid cancer patients with a negative I-131 scan and rising thyroglobulin level.

   - Patients with treated medullary carcinoma of thyroid with a raised calcitonin level and negative or equivocal conventional imaging.
Estimated number of scans for NHS Scotland = 215

References

British Nuclear Medicine Society (2008) UK PET-CT Advisory Board - Clinical Indications for Positron Emission Tomography


Protocol for the use of PET scanning in the management of lung cancer.

Positron Emission Tomography using radio-labelled glucose (18 FDG) has been shown in many studies to be more accurate than standard staging investigations using CT scanning for the detection of involved mediastinal nodes, adrenal metastases and bone metastases. The HTA (2007) confirmed earlier findings that there were cost effective indications for the use of PET scanning in the management of lung cancer.

Indications for the use of PET scanning

In the first instance, the focus should be on where a PET scan would/could change management/treatment plans. A PET scan is only appropriate on an individual named patient basis where there was some indication that it would change management and the role of the scan will be subject to detailed audit.

1. Pre-operative staging for patients with Stage I or II Non-small-cell lung cancer (NSCLC), with the exception of small ≤ 2cm peripheral T1 N0 lesions.
2. Staging of patients with Stage I - III NSCLC in whom radical radiotherapy is proposed.
3. Assessment of patients with a solitary pulmonary nodule (a minimum of 8mm) in whom biopsy is deemed too risky or is non diagnostic.
4. Assessment of patients with a solitary site of possible metastatic disease e.g. adrenal gland in whom conventional tests, such as, MRI have been unhelpful.

Estimated number of scans for NHS Scotland = 2293

References:-


Protocol for the use of PET scanning in the management of patients with lymphoma.

In November 2002 the then Health Technology Board for Scotland (HTBS) published its Health Technology Assessment (HTA) that stated that:

All patients who require restaging of Hodgkin’s disease should be sent for a FDG-PET scan. Extension to the restaging of all patient with lymphoma should be investigated by further research.

Significant additional new research into the use of PET scan in malignant lymphomas has since been published. Furthermore, the International Working Group for Non-Hodgkin’s lymphoma have recently proposed new response criteria and associated guidelines on the use of PET imaging in lymphomas (Juweid et al, 2007; Cheson et al, 2007). The undernoted protocol has been developed in light of the emerging evidence.

Indications for the use of PET scanning

Hodgkin’s disease (HD) (~ 230 new scans in Scotland each year).

1. All newly diagnosed patients with Hodgkin’s disease (HD) being considered for curative therapy should have a baseline scan.

2. Early stage HD after 3 courses of treatment within the context of the NCRI trial.

3. Patients with advanced HD (stage IIB, III and IV) who need to be considered for a change to more intensive chemotherapy early in their treatment plan (after 2 cycles of chemotherapy).

4. All HD patients with residual masses post treatment who have not been shown to be PET negative at an interim scan.

5. Patients with relapsed HD undergoing further treatment with curative intent should be considered for baseline and post treatment scanning where this will influence management.

6.1 Paediatrics: Patients should be scanned in accordance with CCLG national guidelines. All paediatric patients should be referred to Aberdeen as they currently meet the safety requirements outlined by the UK PET Advisory Group.

Non Hodgkin’s Lymphoma

1. The only indication for PET scanning in low-grade Lymphomas is in stage 1A follicular disease where curative radiotherapy is being considered.

2. Diffuse large B cell lymphoma with residual masses at the end of chemotherapy treatment.

3. Paediatrics: PET scanning may be considered in individual cases where there is a residual mass at the end of chemotherapy treatment.
Estimated number of scans for NHS Scotland = 515

References:


Phase 3 trial – Using PET scans to help decide treatment options for early stage Hodgkin’s lymphoma – Chief Investigator Professor John Radford – supported by Leukaemia Research Fund.


Protocol for the use of FDG-PET/CT scanning in the management of oesophageal or oesophagogastric junctional (OGJ) cancer.

This protocol is based on best available evidence and has been produced with the assistance of experts from across NHS Scotland. The PET Advisory Group and the three Regional Cancer Advisory Groups have endorsed this protocol.

It has been designed to complement existing SIGN guidance (SIGN, 2006) and the HTA - Overview of the clinical effectiveness of positron emission tomography imaging in selected cancers (Facey et al, 2007).

There is insufficient evidence to support FDG-PET/CT in routine staging of all newly diagnosed patients with oesophageal or OGJ cancers. There is developing interest in the use of FDG-PET/CT in monitoring response to treatment but at present there is insufficient evidence to justify its routine use.

Indications for FDG-PET/CT in oesophageal/OGJ cancer.

In the first instance, the focus should be on where a FDG-PET scan would/could change management/treatment plans. FDG-PET scans are only appropriate on an individual named patient basis where there was some indication that it would change management. The diagnostic utility of the scans will be subject to detailed audit.

Newly Diagnosed Oesophageal/OGJ cases

- All newly diagnosed patients with oesophageal/OGJ cancer being considered for radical surgery/chemoradiotherapy should have primary staging with CT, +/- EUS, +/- laparoscopy (depending on location of tumour).

- Patients deemed suitable for radical concurrent chemoradiotherapy or surgery should proceed to FDG-PET/CT on the basis of this staging and following MDT assessment. There is no evidence to indicate the most effective strategy for performing PET/CT in relation to locoregional staging with EUS and PET/CT may be performed before or after EUS depending on local centre policy and individual patient circumstances.

Detection of Recurrent Disease

- FDG-PET/CT should be considered in patients with clinically suspected recurrent disease in whom CT and/or endoscopy are equivocal/negative following MDT assessment.

Estimated number of scans for NHS Scotland = 408

References


PET/CT PROTOCOL DEVELOPMENT

**NEED:** Identified by clinicians or PET SLWG Group members (and agreed by PET SLWG Group Members)

**PROCESS:** PET SLWG Group members nominate relevant colleagues from each of the networks

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Central meeting arranged

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Evidence collected and circulate to members for consideration

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Meeting: members discuss and agree terminology

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Protocol written to include impact on service (i.e. estimated numbers and capacity issues) and references considered

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Emailed to group for comments and amendments (as many times as necessary until agreement reached)

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Back to PET SLWG Group for agreement

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Circulated to network managers to take to RCAGS

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Once agreed by all RCAGS circulated to service via Regional Network Managers for onward distribution (appropriate distribution to be agreed for each protocol to ensure reaches target audience)

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Circulated at same time to PET SLWG Group members for information.