

PET-INDISPENSABLE TOOL

- Introduction
- Cost-effectiveness
- Protocols
- Codes & Fees

Structural imaging

Radiology

General Xray

CT

Ultrasound

Magnetic Resonance Imaging

Metabolic Imaging

Nuclear Medicine

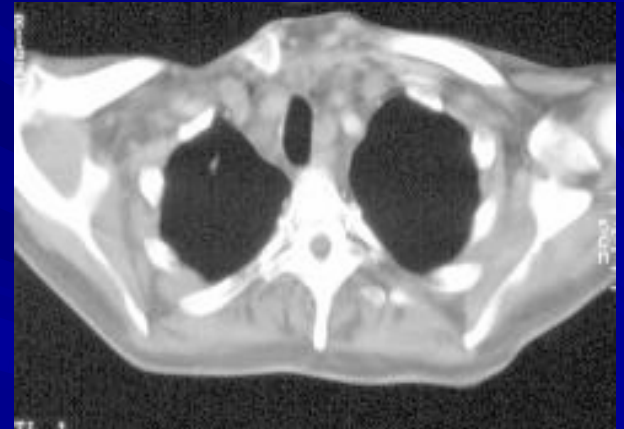
Planar scintigraphy

SPECT

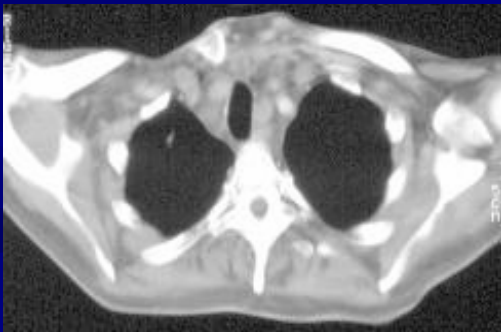
PET

PET IN ONCOLOGY

■ FDG-PET - the “smart” image

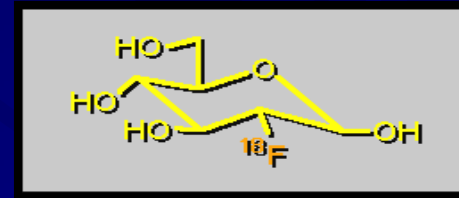


PET & CANCER



How to do PET

FDG Fluorodeoxy-Glucose



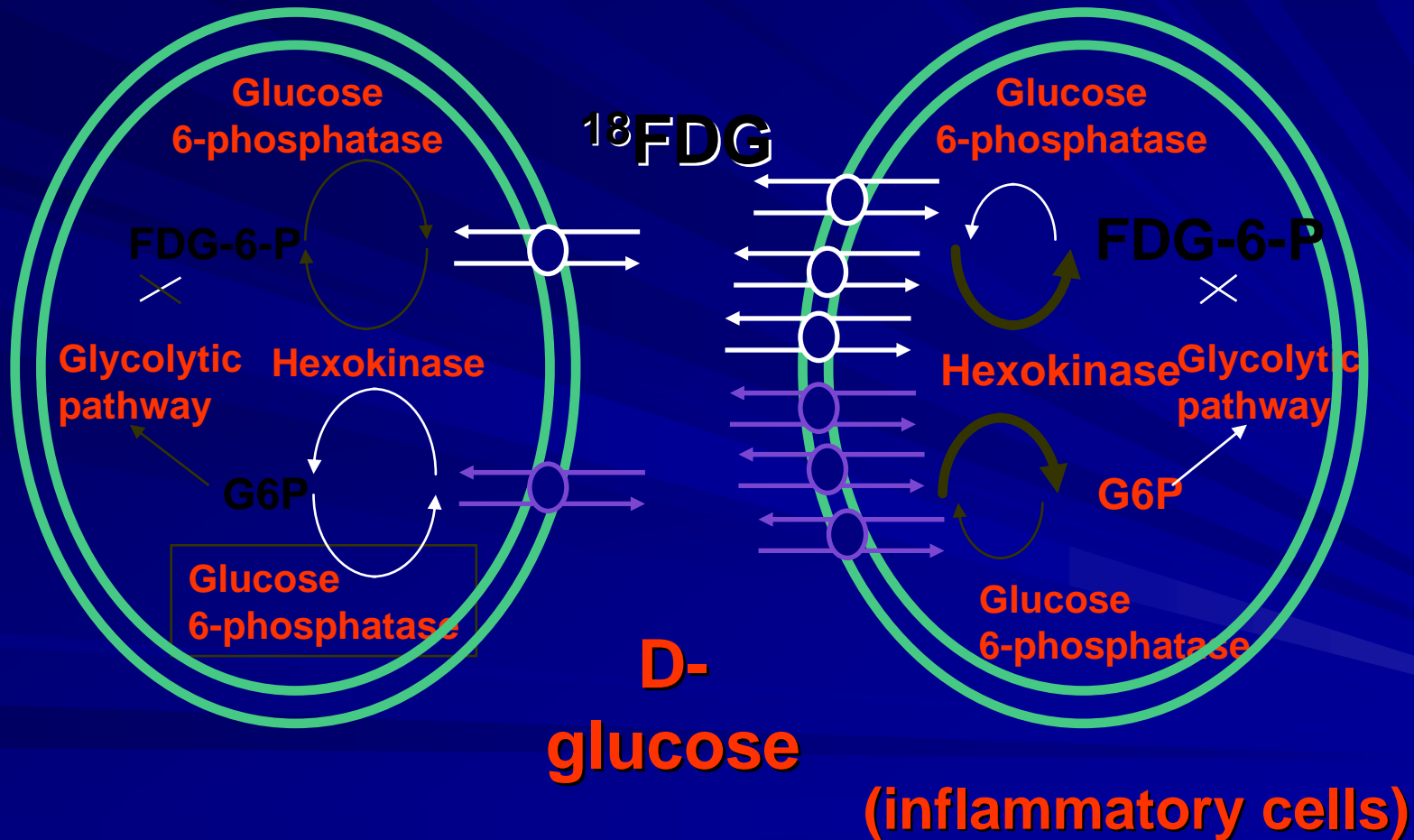
- FDG Fluorodeoxy-Glucose
- Metabolically behaves like glucose
- Measure rate of metabolism
- Due to the relatively long half-life, it can be distributed
- Therefore it can apply to:
 - Cancer Search (Higher Metabolism)
 - Brain (Main user of energy)

FDG is
produced
automatically
from ^{18}F

FDG uptake in cancer cells

Normal Cell

Neoplastic Cell



CURRENT INTERNATIONAL TRENDS

- PET shows the fastest procedure growth of any diagnostic modalities
- Oncology accounts for 82%

THE GREATEST VALUE IS DIAGNOSTIC ONCOLOGY

- THIS INCLUDES:
 - Hogkins and Non-Hodgkins Lymphoma
 - Thyroid/head and neck cancer
 - Breast cancer
 - Gastro-intestinal tumors especially colo-rectal cancer
 - Urological malignancies
 - Oesophageal malignancies
 - Melanoma
 - Non-small cell lung carcinoma

■ HOW DOES IT HELP ?

- Characterisation of disease (SPN)
- Initial staging (not all cancers)
- Restaging and monitoring of therapy

■ CONDITIONS:

- There would have to be standardized protocols based on International models (Europe and the US)
- The use of PET in aiding in a diagnosis if PET assists in
 - * in avoiding invasive diagnostic procedures
 - * in determining optimal anatomical location for invasive diagnostic procedures
- The use in staging and restaging when
 - * Doubt remains after a standard clinical workup
 - * PET can replace one or more conventional imaging studies to give better information for clinical management
- Monitoring the response to therapy
 - * If it assists in avoiding surgery and improves patient outcome

Examples from current literature

- A Net search on the website of the Radiological Society of North America shows 481 articles in the past 3 years in which PET was the main topic.
- The journal of Nuclear medicine Volume 41 no 5 is a table related summary of the FDG PET Literature. It serves as a useful tool for the measurement of the management effect as a result of PET imaging and is available for your scrutiny.
- More recently the Radiological clinics of North America Volume 42 No 6 & 7 November 2004 and January 2005 is dedicated to PET imaging.

- It emphasizes that PET is a revolution in medical imaging
 - It discusses instrumentation
 - It explores the potential of the development of other Isotopes
 - It discusses the usefulness of PET in the management of patient's with:
 - * Hodgkins and Non-Hodgkins lymphoma
 - * Thyroid head and neck and cancer
 - * Breast cancer
 - * GI tumors
 - * Urological malignancies
 - * Gynaecological malignancies

QUOTE FROM THE ARTICLE ON THE IMAGING OF LYMPHOMA'S

PET and CT must be considered as given complimentary staging information. FDG PET also has high diagnostic accuracy for restaging lymphoma after initial treatment.

FDG PET has shown high accuracy in the early prediction of response to chemotherapy and in the evaluation of residual masses after chemo or radiation therapy.

SUMMARY

- PET is established and reimbursed in the rest of the world.
- There are a number of articles relating to the cost effectiveness of PET
- The timing is ideal for the introduction of PET into the country because
 - * new developments in the Isotope industry
 - * the strong rand
- It must be emphasized that the introduction is a transparent process
- There is also drive from academic groups for the introduction of PET
- PET certainly has applications in paediatric oncology (possibly aids research)
- Clinical trials now depend on PET as part of their research base

COST EFFECTIVENESS

- Difficult to accurately quantify
- Many references in literature
- Different models used
- List of relevant articles
- Some of applications of PET that have been subject to cost effectiveness analysis are shown in the next slide.

TARGET POPULATION

EVALUATION METHOD

REFERENCE

Coronary artery disease

Decision Analysis Model

Garber (19)
Patterson (20)
Maddahi

Solitary Pulmonary Nodule

Decision Analysis Model
Decision Analysis Model
Decision Analysis Model

Gambhir (21)
Gould
Dietlein (17)

Staging NSCLC

Decision Analysis Model
Decision Analysis Model
Decision Analysis Model

Gambhir (22)
Dietlein (23)
Scott (24)

Re-staging colorectal cancer

Decision Analysis Model

Park Sanders (18)

Lymphoma staging

Retrospective costing

Hoh (25)
Klose (26)

Multiple tumors

Retrospective costing

Valk (28)

Dementia

-

Small (29)

SOLITARY PULMONARY NODULE

- FDG PET is cost effective when pre-test probability and CT results are discordant, the risk of surgical complication is high, the diagnostic yield of needle biopsy is low or the utility of time spent in observation is low

STAGING OF NSCLC

- * Cost effective in staging all patients and NSCLC.
- * Most cost effective in staging patients with normal sized lymphnodes on CT examination

STAGING OF RECURRENT COLO-RECTAL CANCER

- CT and PET is cost effective for the evaluation of resectability
- Up to 30% of patients referred for elective metastectomy have other metastatic lesions.

STAGING OF LYMPHOMA

- Cost effective in Hodgkin's and Non-Hodgkin's lymphoma
- Cost per correct stage was assessed comparing CT to whole body FDG PET
– 81% vs 100 %
- Very accurate for measuring response to therapy

COST SAVINGS

**An example taken from the 10th Annual Institute of
clinical PET conference Boston MA.**

Regarding colo-rectal cancer, the clinical questions became:

- Can FDG PET more accurately stage the patient with potentially resectable colon rectal cancer?
- Can FDG PET be decreasing a number of unnecessary procedures including surgery be more cost effective in the clinical setting?

- Surgical procedures were avoided by demonstration of non-resectable tumour in 25 patient's and calculated on the basis of PET reimbursement at \$1800, the net savings amounted to a total of \$3760 per patient. The conclusion was that whole body metabolic PET imaging is more accurate than CT alone for the demonstration of recurrent colo-rectal cancer and is a cost effective means of differentiating resectable from non-resectable disease. The findings were similar to other trials done regarding colo-rectal cancer.

SUMMARY

- Mc Master university currently assessing economics of PET scanners (2 clinical trials)
- Institute of clinical PET have also co-ordinated a number of trials many of which are currently under way
- Available literature does support the cost effectiveness of CT/PET if appropriately used
- Therefore it is proposed that the modality be strictly protocol driven to ensure adequate control

PROPOSED PROTOCOLS

- Modality in SA should be strictly protocol driven
- Will serve to prevent excessive use of modality
- Protocols drawn up using

- (i) Local knowledge - Radiologists
 - Nuclear Physician
 - Oncologists
- (ii) US Medicare protocols
- (iii) UK NHS Guidelines

Covered Indications for PET Scans in South Africa and Limitations/Requirements for Usage (SAPUA protocol task group)

- For all uses of PET relating to malignancies the following conditions apply:
- **A. Diagnosis**
 - PET is covered only in clinical situations in which: (1) the PET results may assist in avoiding an invasive diagnostic procedure, or in which (2) the PET results may assist in determining the optimal anatomical location to perform an invasive diagnostic procedure. In general, for most solid tumors, a tissue diagnosis is made prior to the performance of PET scanning. PET scans following a tissue diagnosis are generally performed for staging rather than diagnosis.
 - PET is not covered as a screening test (i.e., testing patients without specific signs and symptoms of disease).
- **B. Staging**
 - PET is covered for staging in clinical situations in which: (1)(a) the stage of the cancer remains in doubt after completion of a standard diagnostic workup, including conventional imaging (computed tomography (CT), magnetic resonance imaging (MRI), or ultrasound), or (1)(b) it could potentially replace one or more conventional imaging studies when it is expected that conventional study information is insufficient for the clinical management of the patient, and 2) clinical management of the patient would differ depending on the stage of the cancer identified.

■ C. Restaging

- PET is covered for restaging: (1) after completion of treatment for the purpose of detecting residual disease, (2) for detecting suspected recurrence or metastasis, (3) to determine the extent of a known recurrence, or (4) if it could potentially replace one or more conventional imaging studies when it is expected that conventional study information is insufficient for the clinical management of the patient. Restaging applies to testing after a course of treatment is completed, and is covered subject to the conditions above.

■ D. Monitoring

- This refers to use of PET to monitor tumor response to treatment during the planned course of therapy (i.e., when a change in therapy is anticipated).
- Clinical records documenting the medical necessity of the study must be available at the provider of the PET study or the referring physician.

A POSITRON EMISSION TOMOGRAPHY DONE WITH COINCIDENCE GAMMA CAMERAS.

■ *Technical specifications*

- These coincidence systems must have all the following features:
 - - Crystal at least 5/8-inch thick;
 - - Techniques to minimize or correct for scatter and/or randoms; and
 - - Digital detectors and iterative reconstruction.
- Scans performed with gamma camera PET systems with crystals thinner than 5/8" should not be covered. In addition, scans performed with systems with crystals greater than or equal to 5/8" in thickness, but that do not meet the other listed design characteristics should not be covered.

■ *Indications*

- • Characterization of single pulmonary nodules.(Requires diagnostic evidence of primary tumor prior to PET. Tumour must be between 1- 4cm. Not covered if prior negative PET within 90 days.
- • Initial staging of lung cancer (non small cell)
- • Determining location of colo-rectal tumors if rising CEA level suggests recurrence(once per year)
- • Staging or restaging of lymphoma only when used as alternative to gallium scan (up to four times per year)
- • Evaluating recurrence of melanoma prior to surgery (once per year)

INDICATIONS

■ ABSOLUTE INDICATIONS

- subject to the completion of the appropriate requisition form and then to normal pre-authorisation

■ RELATIVE INDICATIONS

- subject to peer review

■ FUTURE INDICATIONS

- subject to evidence development – not for 2006

B) INDICATIONS FOR PET/CT AND DEDICATED PET SYSTEMS (FULL AND PARTIAL RING)

1) ABSOLUTE INDICATIONS

	INDICATIONS FOR 2005/2006	FREQUENCY OF SCAN
ONCOLOGY APPLICATIONS		
PAROTID	Identification of metastatic disease in the neck from a diagnosed malignancy	1 / year
MALIGNANCIES OF THE OROPHARYNX	Diagnosis, initial staging, restaging	up to 4 / year
LARYNX	Diagnosis, initial staging, restaging	up to 2 / year
THYROID	1) Assessment of patients with elevated thyroglobulin (or suspected false negative value) and negative iodine scans for recurrent disease. Applicable only in patients who did have a thyroidectomy and / or I-131 treatment 2) Assessment of tumour recurrence in medullary carcinoma of the thyroid	up to 2 / hear
LUNG	1) Differentiation of benign versus malignant lesions where anatomical imaging or biopsy are inconclusive or there is a relative contraindication to biopsy. The lesion must be between 1 – 4 cm in size. 2) Pre-operative staging of non small cell primary lung 3) Assessment of recurrent disease in previously treated tumours where anatomical imaging is unhelpful. 4) Assessment of response to treatment	not more than every 90 days 1 / year up to 4 / year

OESOPHAGUS	<ol style="list-style-type: none"> 1) Staging of primary cancer 2) Assessment of disease recurrence in previously treated cancers 3) Assessment of neo-adjuvant chemotherapy 	up to 4 / year
BREAST CANCER	<ol style="list-style-type: none"> 1) Assessment of the extent of disseminated disease 2) Assessment of multi-focal disease 3) Suspected local recurrence 4) Assessment of chemotherapy response 	up to 4 / year
COLON AND RECTUM	Diagnosis, initial staging and restaging	up to 4 / year Intervals not less than 12 months with no rising CEA levels.
LYMPHOMA	<ol style="list-style-type: none"> 1) Staging of Hodgkins lymphoma 2) Staging of non-Hodgkins lymphoma 3) Assessment of residual masses for active disease 4) Identification of disease sites when there is suspicion of relapse from clinical assessment. 5) Response to chemotherapy 6) Assessment of remission from lymphoma 	up to 4 / year every 12 months
MELANOMA	Initial staging and restaging (not for evaluating regional nodes)	

2) RELATIVE INDICATIONS

ONCOLOGY

Liver – secondary lesion	1) Equivocal diagnostic imaging (CT, MRI, Ultrasound)	1 / year
	2) Exclude other metastatic disease prior to metastectomy	1 / year
Renal and adrenal	Assessment of possible adrenal metastases	1 / year
Testicle	1) Assessment of recurrent disease from seminomas and teratomas	1 / year
	2) Assessment of residual masses	
Ovary	Initial staging (in stage 1A disease where adjuvant therapy is not contemplated) and restaging	up to 4 / year

UTERUS – CERVIX	difficult situations to define the extent of disease with accompanying image registration (staging and restaging)	up to 4 / year
METASTASES FROM UNKNOWN PRIMARY	Determining the site of an unknown primary when this influences management	up to 1 / year
NEUROPSYCHIATRY APPLICATIONS	1) Pre-surgical evaluation of epilepsy. 2) Early diagnosis of dementia, especially younger patients (particularly Alzheimer's disease) when MR of CT is either normal, marginally abnormal or equivocally abnormal.	up to 1 / year
MICELLANEOUS APPLICATIONS		
FEVER OF UNKNOWN ORIGIN	Identifying source of the fever of unknown origin when conventional diagnostic workout remains unequivocal.	

3) FUTURE INDICATIONS SUBJECT TO EVIDENCE DEVELOPMENT

ONCOLOGY APPLICATIONS

BRAIN AND SPINAL CORD

- 1) Suspected tumour recurrence when anatomical imaging is difficult or equivocal and management will be affected.
Often a combination of methionine and FDG PET scans will need to be performed.
- 2) Benign versus malignant lesions, where there is uncertainty on anatomical imaging and a relative contraindication to biopsy.
- 3) Investigation of the extent of tumour within the brain or spinal cord.
- 4) Secondary tumours in the brain
- 5) Assess tumour response to therapy.

PARATHYROID

Localisation of parathyroid adenomas with methionine when other investigations are negative

PANCREAS

- 1) Staging a known primary.
- 2) Differentiation of chronic pancreatitis from pancreatic carcinoma.
- 3) Assessment of pancreatic masses to determine benign or malignant status.

MUSCULOSKELETAL TUMOURS

- 1) Soft tissue primary mass assessment to distinguish high grade malignancy from low or benign disease
- 2) Staging of primary soft tissue malignancy to assess non-skeletal metastases
- 3) Assessment of recurrent abnormalities in operative sites
- 4) Assessment of osteogenic sarcomas for metastatic disease
- 5) Follow up to detect recurrence or metastases

HEART

Diagnosis or coronary artery disease or assessment of known coronary stenosis where other investigations (spect, etc.) are unhelpful

DISEASE ASSESSMENT IN HIV AND OTHER IMMUNOSUPPRESSED PATIENTS

- 1) Identifying sites to biopsy in patients with pyrexia.
- 2) Differentiating benign from malignant cerebral pathology
- 3) Routine assessment of weight loss where malignancy is suspected.

ASSESSMENT OF BONE INFECTION

Assessment of spinal infection or problematic cases of infection.

ASSESSMENT OF BONE METASTASES

When bone scan or other imaging is equivocal.

ASSESSMENT OF TUMOUR RECURRENCE IN THE PITUITARY

Identifying recurrent functional pituitary tumours when anatomical imaging has not been successful.

REQUISITION FOR WHOLE BODY PET

Esophageal, Head /Neck, or Colorectal cancer, Melanoma and Lymphoma

- Date: -- ____ / ____ / ____
- Patient name: _____
- Medical aid: _____
- Medical aid number: _____
- Practice number: _____
- ICD-10 Code(s): _____
- Reason for Exam: _____
- Has patient had recent CT? ____ Yes ____ No
- Has patient had recent biopsy? ____ Yes ____ No
- *Instructions: Please check below to indicate the type of PET scan ordered and answer the questions included in each category.*
- *If your patient does not meet payor medical necessity guidelines, there is a high probability that they will have to pay for this exam.*
- *Please fax this requisition, with recent CT or biopsy/pathology reports to _____ ■*

■ **TYPE OF CANCER:**
___ Esophageal, ___ Head and Neck, ___ Colorectal, ___ Lymphoma, ___ Melanoma. ___

■ **DIAGNOSIS: (Covered only if YES is answered to 2. or 3.)**

- 1. If tissue diagnosis of malignancy has been made, you must use "Initial Staging" category.
- 2. Will this PET assist in avoiding an invasive exam? ___ Yes ___ No
- 3. Will PET assist in determining optimal anatomical site for an invasive procedure?
___ Yes ___ No

■ **INITIAL STAGING (Covered only if YES is answered to 2. OR 3. AND 4.)
(Not covered for evaluation of regional lymph nodes for melanoma.):**

- 1. Date of tissue diagnosis: _____
- 2. Does the stage of the cancer remain in doubt after completion of a standard diagnostic work-up?
___ Yes ___ No
- 3. Will PET replace conventional imaging studies that are expected to be insufficient for clinical management? ___ Yes ___ No
- 4. Will clinical management of the patient differ depending on stage identified? ___ Yes ___ No

■ **RESTAGING (Covered only if YES is answered to 1. OR 2.):**

- 1. Is this PET being performed after the completion of treatment for detection of residual or suspected recurrent disease or to determine the extent of a known recurrence?
___ Yes ___ No
- 2. Will PET replace conventional imaging studies that are expected to be insufficient for clinical management?
___ Yes ___ No

■ **Date:** _____

■ **Physician Signature:** _____

■ **Physician Name Printed:** _____

■ **Physician Phone:** _____

REQUISITION FOR WHOLE BODY PET – LUNG

- Date: --____/____/____
- Patient name:_____
- Medical aid:_____
- Medical aid number:_____
- Practice number:_____
- ICD-10 Code(s): _____
- Reason for Exam: _____
- ** Note: ICD-9 code 162.9 is not specific enough to meet medical necessity – please indicate specific nodule site*
- Has patient had recent CT? ____ Yes ____ No
- Has patient had recent biopsy? ____ Yes ____ No
- ***Instructions: Please check below to indicate the type of PET scan ordered and answer the questions included in each category. If your patient does not meet the medical necessity guidelines, there is a high probability that your patient have to pay for this exam.. Please fax this requisition, with CT or biopsy/pathology reports to_____.***

- **Single Pulmonary Nodule (covered only if YES is answered to 3. and 4.):**
- 1. If a tissue diagnosis of malignancy has been made, use the “Lung Cancer – Initial Staging” category.
- 2. If > 4 cm, use the “Lung Cancer-Diagnosis” category.
- 3. Is nodule less than 4 cm in diameter? ___ Yes ___ No ___ Unknown
- 4. Is nodule indeterminate by chest x-ray or CT criteria? ___ Yes ___ No

■ **Lung Cancer (non-small cell only) for:**

DIAGNOSIS (covered only if YES is answered to 2. or 3.):

- 1. If tissue diagnosis of malignancy has been made, you must use “Initial Staging” category.
- 2. Will this PET assist in avoiding an invasive exam? ___ Yes ___ No
- 3. Will PET assist in determining optimal anatomical site for invasive procedure? ___ Yes ___ No

INITIAL STAGING (covered only if YES is answered to 2. OR 3. AND 4.):

- 1. Date of tissue diagnosis: _____ Finding: ___ NSCLC ___ Other
- 2. Does the stage of the cancer remain in doubt after completion of a standard diagnostic work-up?
 ___ Yes ___ No
- 3. Will PET replace conventional imaging studies that are expected to be insufficient for clinical management?
 ___ Yes ___ No
- 4. Will clinical management of the patient differ depending on stage identified? ___ Yes ___ No

RETAGGING (covered only if YES is answered to 1. or 2.):

- 1. Is this PET being performed after the completion of treatment for detection of residual or suspected recurrent disease or to determine the extent of a known recurrence? ___ Yes ___ No
- 2. Will PET replace conventional imaging studies that are expected to be insufficient for clinical management?
 ___ Yes ___ No

Date: _____

Physician Signature: _____

REQUISITION FOR WHOLE BODY PET – Breast Cancer

- Date: --___ / ___ / ___
- Patient name: _____
- Medical aid: _____
- Medical aid number: _____
- Practice number: _____
- ICD 10Code(s): _____
- Reason for Exam: _____
- Has patient had recent CT? ___ Yes ___ No
- Has patient had recent biopsy? ___ Yes ___ No
- *Instructions: Please check below to indicate the type of PET scan ordered and answer the questions included in each category. If your patient does not meet payor medical necessity guidelines, there is a high probability that they will have to pay for this exam . Please fax this requisition, with recent CT or biopsy/pathology reports to _____*

- **BREAST CANCER** (covered only if YES is answered to 2., 3., or 4.)
- (not covered for initial diagnosis or for evaluation of regional lymph nodes)
- 1. Tissue diagnosis: ___ Yes ___ No Date _____
- 2. Is PET performed for staging patients with distant metastases? ___ Yes ___ No
- 3. Is PET performed for restaging patients with locoregional recurrence or metastases? ___ Yes ___ No
- 4. Is PET performed to monitor the results of treatment and is a change in therapy contemplated based on PET results? ___ Yes ___ No

- Date: _____
- Physician Signature: _____
- Physician Name Printed: _____
- Physician Phone: _____

REQUISITION FOR WHOLE BODY PET – Thyroid Cancer

- Date: --____ / ____ / ____
- Patient name: _____
- Medical aid: _____
- Medical aid number: _____
- Practice number: _____
- ICD-10 Code(s): _____
- Reason for Exam: _____
- Has patient had recent CT? ____ Yes ____ No
- Has patient had recent biopsy? ____ Yes ____ No
- *Instructions: Please check below to indicate the type of PET scan ordered and answer the questions included in each category. If your patient does not meet payor medical necessity guidelines, there is a high probability that they will have to pay for this exam. Please fax this requisition, with recent CT or biopsy/pathology reports to _____*

- **Thyroid Cancer**(covered only for assessment of patients with recurrent or residual thyroid cancers of follicular origin with elevated thyroglobulin(or suspected false negative value) and negative iodine scans for recurrent disease. Applicable only in patients who did have a thyroidectomy and/or I-131 treatment: if YES is answered to 1., 2., 3., 4., and 5.)

- **(Medullary and anaplastic cancers are not typically covered)**

- 1. Tissue diagnosis: follicular origin ___ Yes ___ No Date _____
- 2. Thyroidectomy: ___ Yes ___ No Date _____
- 3. Radioiodine therapy: ___ Yes ___ No Date _____
- 4. Thyroglobulin levels > _____: ___ Yes ___ No Date _____
- 5. Negative I-131 whole body scan: ___ Yes ___ No Date _____
- 6. Thyrogen administration: ___ Yes ___ No
- 7. Hormonal withdrawal: ___ Yes ___ No Date Last Dose _____

■ **Date:** _____

■ **Physician Signature:** _____

■ **Physician Name Printed:** _____

■ **Physician Phone:** _____

REQUISITION FOR Cardiac PET

■ Date: --___ / ___ / ___

■ Patient name: _____

■ Medical aid: _____

■ Medical aid number: _____

■ Practice number: _____

ICD-10Code(s): _____

Reason for Exam: _____

■ Has patient had any of the following procedures recently (check all that apply):

■ ___ CT of the chest or heart?

■ ___ MRI of the chest?

■ ___ PET cardiac imaging?

■ ___ Nuclear medicine cardiac SPECT imaging? If yes, ___ Resting OR ___ Stress

■ ___ Coronary angiography?

■ ___ Stress echocardiogram?

■ ___ Electrocardiogram? If yes, ___ Resting OR ___ Stress ?

■ ___ Coronary artery bypass graft (CABG)? Date: _____

■ ___ Percutaneous Coronary Intervention (PCI)? Date: _____

■ *Instructions: Please check below to indicate the type of PET scan ordered and answer the questions included in each category. If your patient does not meet payor medical necessity guidelines, there is a high probability that they will have to pay for this exam). Please fax this requisition, with recent nuclear cardiology and coronary angiogram reports to _____*

■ PET is covered if YES is answered to 1. or 2.

■ Myocardial Viability with FDG

■ Resting myocardial perfusion with 13N-ammonia

■ Is the PET scan performed in place of, but not in addition to a SPECT scan? ____ Yes ____ No

■ Is the PET scan performed following a SPECT scan found to be inconclusive and is PET considered necessary in order to determine how to treat the patient? ____ Yes ____ No

■ Pharmacological Stress myocardial perfusion with 13N-ammonia

■ Is the PET scan performed in place of, but not in addition to a SPECT scan? ____ Yes ____ No

■ Is the PET scan performed following a SPECT scan found to be inconclusive and is PET considered necessary in order to determine how to treat the patient? ____ Yes ____ No

■ Date: _____

■ Physician Signature: _____

■ Physician Name Printed: _____

■ Physician Phone: _____

CODES AND FEES

00950	PET scan local	-
00951	PET/CT local	7,019
00952	PET/CT local with contrast	7,202
00955	PET scan whole body	-
00956	PET/CT scan whole body without contrast	8,978
00957	PET/CT scan whole body with contrast	9,161
	REGIONAL	
10970	PET scan of the brain	-
10971	PET/CT scan of the brain uncontrasted	6,834
10972	PET/CT of the brain contrasted	7,036
10980	PET perfusion scan of the brain	-
10981	PET/CT perfusion scan of the brain	7,872
21960	PET scan of the thyroid	-
22940	PET scan of the parathyroid	-
29960	PET scan of the soft tissue of the neck	-
29961	PET/CT scan of the soft tissue of the neck uncontrasted	6,927
29962	PET/CT scan of the soft tissue of the neck contrasted	7,128
30980	PET scan of the chest	-
30981	PET/CT scan of the chest uncontrasted	6,927
30982	PET/CT scan of the chest contrasted	7,128
30983	PET/CT scan of the chest pre and post contrast	8,933
34900	PET scan of the breast/mamma	-
33980	PET scan of the heart	-
33981	PET/CT scan of the heart?	7,459
43961	PET scan of the testis	-
40950	PET scan of the abdomen and pelvis	-
40951	PET/CT scan of the abdomen and pelvis uncontrasted	8,230
40952	PET/CT scan of the abdomen and pelvis contrasted	8,432
40953	PET/CT scan of the abdomen and pelvis pre and post contrast	9,847

REFERENCES

■ 1. ONCOLOGY

* GENERAL

Weinstein MC, Stason WB. Foundations of cost-effectiveness for health and medical practices. *New England Journal of Medicine* 1977;296:716-21.

* LUNG

Dietlein M, Weber K, Gandjour A et al. Cost effectiveness of FDG PET for the management of solitary pulmonary nodules; a decision analysis based on cost reimbursement in Germany. *Eur J Nucl Med* 2000;27: 1441-1456.

Dietlein M, Weber K, Gandjour A et al. Cost effectiveness of FDG PET for the management of potentially operable non-small cell lung cancer: priority for a PET-based strategy after nodal-negative CT results. *Eur J Nucl Med* 2000;27:1598-1609

Gambhir SS, Hoh CK, Phelps ME et al. Decision tree sensitivity analysis for cost effectiveness of FDG PET in the staging and management of non-small cell lung carcinoma. *J Nucl Med* 1996;37:1428-1436.

Gambhir SS, Shepherd JE, Shah BD et al. Analytical decision model for the cost effective management of solitary pulmonary nodules. *J Clin Oncol* 1998;16:2113-2125

Dietlein M, Weber K, Gandjour A et al. Cost effectiveness of FDG PET for the management of solitary pulmonary nodules: a decision analysis based on cost reimbursement in Germany. *Eur J Nucl Med* 2000;27:1441-1456.

Dietlein M, Weber K, Gandjour A et al. Cost effectiveness of potentially operable non-small cell lung cancer: priority for a PET-based strategy after nodal-negative CT results. *Eur J Nucl Med* 2000;27:1598-1609

* COLO-RECTAL

Huebner RH, Park KC, Shepherd JE et al. A meta-analysis of the literature for whole body FDG PET detection of recurrent colorectal cancer. *J Nucl Med* 2000;41;1177-1189.

Park KC, Schwimmer J, Shepherd JE et al. Decision analysis for the cost-effective management of recurrent colorectal cancer. *Ann Surg* 2001;233(3):310-319

*

OROPHARYNX

Hollenbeak CS, Lowe VJ, Stack BC Jr. The cost effectiveness of fluorodeoxyglucose 18-F positron emission tomography in the N0 neck. *Cancer* 2001;92:2341-2348

Adams S, Baum RP, Stuckensen T et al. Prospective comparison of 18F-FDG PET with conventional imaging modalities (CT, MRI, US) in lymph node staging of head and neck cancer. *Eur J Nucl Med* 1998;25:1255-1260

*

LYMPHOMA

Klose T, Leidl R, Buchmann, I, Brambs HJ, Reske SN. Primary staging of lymphomas: cost-effectiveness of FDG-PET versus computed tomography. *European Journal of Nuclear Medicine* 2000;27(10):1457-64

Hob CK, Glaspy J, Rosen P, Dahlbom M, Lee SJ, Kunkel L et al. Whole-body FDG-PET imaging for staging of Hodgkin's disease and lymphoma. *Journal of Nuclear Medicine* 1997;38(3):343-8.