PET PROS
PET Professional References & Outreach Source

Part II: NCCN Practice Guidelines Narrative Summary

PET and PET/CT

NCCN guidelines were reviewed on 12/03/2008 for utilization of PET and PET/CT (available at: http://www.nccn.org/professionals/physician_gls/f_guidelines.asp). This narrative summary lists all of the practice guidelines, and describes the specific indications for PET and PET/CT.

Acute Myeloid Leukemia (v.1.2009): No PET

Bladder cancer (v.1.2009): No PET

Note: Bone scan recommended for staging if alkaline phosphatase elevated or symptoms, and in patients with metastatic disease

Bone cancer (v.1.2009)

a. Chondrosarcoma: No PET
b. Ewing sarcoma: PET scan and/or bone scan (staging); consider PET scan or bone scan (restaging); consider PET scan or bone scan (surveillance)
c. Osteosarcoma: PET scan and/or bone scan (staging); consider PET scan, consider bone scan (restaging); consider PET scan and/or bone scan (surveillance)

Breast cancer (v.2.2008): No PET

a. Stage I, IIA, IIB, or T3N1M0 invasive breast cancer: "A PET scan is not recommended in the staging of these patients".
b. Post therapy surveillance and follow-up: "…PET scans…. are not recommended".

Central Nervous System Cancers (v.1.2008)

a. Anaplastic Astrocytoma/Anaplastic oligodendroglioima/ Glioblasoma multiforma: consider MR spectroscopy, MR perfusion, or PET to rule out radiation necrosis (recurrence)
b. Limited (1-3) metastatic lesions: consider PET if 2-3 lesions and no primary found (diagnosis)
c. Multiple (>3) metastatic lesions: consider PET if no primary found (diagnosis)
d. Primary CNS lymphoma: consider body PET scan (Body PET scan may replace CT, bone marrow, and testicular ultrasound, but data for its use in primary CNS lymphoma is lacking) (diagnosis)

Cervical Cancer (v.1.2008)

a. Initial workup: Chest x-ray, PET scan, CT/MRI (optional for ≤IB1) (staging)
b. Para-aortic lymph nodes positive by surgical staging: Chest CT/PET scan (staging)
c. Stage IA1 with lymphovascular space invasion or ≥ stage IA2: Chest x-ray, PET scan, CT/MRI (optional for ≤IB1) (staging)
d. Surveillance: CT/PET scan as clinically indicated (surveillance)
e. Persistent or recurrent disease: pelvic/abdominal/chest CT/PET scan (recurrence)

Chronic Myelogenous Leukemia (v.2.2009): No PET

Colorectal Cancer (v.3.2008)

a. Colon cancer
   1. Initial work-up: No PET (PET scan is not routinely indicated in patients with colon cancer appropriate for resection)
   2. Suspected or proven metastatic or synchronous adenocarcinoma from large bowel (any T, any N, M1): PET scan only if potentially curable M1 disease (staging)
   3. Serial CEA elevation with negative colonoscopy and negative chest abdominal/pelvic CT scan: consider PET scan (recurrence)

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4. Resectable metachronous metastases: PET scan (recurrence)
5. Surveillance: No PET (PET scan is not routinely recommended)

b. Rectal cancer
1. Initial work-up: No PET (PET scan is not routinely indicated)
2. Serial CEA elevation: consider PET scan (recurrence)
3. Resectable metachronous metastases: PET scan (recurrence)
4. Surveillance: No PET (PET scan is not routinely indicated)

c. Anal cancer
1. Initial work-up of anal canal (not anal marginal): PET scan (staging)

Esophageal Cancer (v.1.2009)
a. Initial workup: PET/CT (preferred) or PET scan if no evidence of M1 disease (staging)
b. Medically fit, resectable Tis, T1-T4, N0-1, NX, or stage IVA following neoadjuvant chemoradiation: PET/CT (preferred) or PET scan (category 2B) (restaging)
c. Follow-up: "Imaging as clinically indicated"

Gastric Cancer (v.2.2009)
a. Initial workup: PET/CT or PET scan (optional) (may not be appropriate for T1 or M1 patients) (staging)
b. Post treatment assessment/adjunctive treatment, medically fit unresectable or medically unfit patients following primary therapy: PET/CT or PET scan (optional) (restaging)

Head and Neck Cancers (v.2.2008)
a. Occult primary: PET/CT (before biopsy) (diagnosis)
b. Nasopharynx: Imaging for distant metastases (chest, liver, bone) for WHO class 2-3/N2-3 disease (may include PET scan and/or CT) (staging)
c. Ethmoid sinus, maxillary sinus, salivary gland, lip, oral cavity, oropharynx, larynx, hypopharynx: No PET (see note)
Note: oropharynx, larynx: If PET is used for follow-up, the first scan should be obtained not less than 12 weeks after treatment to reduce the false positive rate

Hepatobiliary (Hepatocellular, Gallbladder, Cholangiocarcinoma) Cancers (v.2.2008): No PET

Hodgkin Disease/Lymphoma (v.2.2008)
a. Initial workup: PET scan (PET/CT always preferred) (staging)
b. Stage IA-IIA: Restage after chemotherapy with PET/CT (an integrated PET/CT or PET with a diagnostic CT is recommended) (restaging)
c. Stage I-II bulky: Restage after chemotherapy with PET/CT (an integrated PET/CT or PET with a diagnostic CT is recommended) (restaging)
d. Stage IB-IIB nonbulky and stage III-IV nonbulky and bulky: Restage after chemotherapy with PET/CT (an integrated PET/CT or PET with a diagnostic CT is recommended) (restaging)
e. Surveillance: No PET (PET scans are not recommended for routine surveillance) (chest CT every 6-12 months during the first 2-5 years; abdominal/pelvic CT every 6-12 months during the first 2-3 years)

Kidney Cancer (v.1.2009): No PET
a. Initial workup: Bone scan if clinically indicated

Melanoma (v.2.2009)
a. Stage IA: Imaging only to evaluate specific signs or symptoms (CT scan, PET, MRI) (staging)
b. Stage IB, Stage II: Further imagine as clinically indicated for Stage IIB, IIC patients (CT scan, PET, MRI) (staging)
c. Stage III (clinically positive nodes): Consider baseline imaging for staging and to evaluate specific signs or symptoms (category 2B) (Chest x-ray, CT ± PET, MRI) (staging)
d. Stage III in-transit: Consider baseline imaging for staging and to evaluate specific signs or symptoms (category 2B) (Chest x-ray, CT ± PET, MRI) (staging)
e. Stage IV metastatic: Encourage chest abdominal/pelvic CT, MRI brain, and/or PET as clinically indicated (category 2B) (staging)
f. Local, satellitosis and/or in-transit recurrence: Consider baseline imaging for staging and to evaluate specific signs or symptoms (category 2B) (Chest x-ray, CT ± PET, MRI) (recurrence)
g. Nodal recurrence: Consider baseline imaging for staging and to evaluate specific signs or symptoms (category 2B) (Chest x-ray, CT ± PET, MRI) (recurrence)
h. Treatment of (distant) metastatic disease: Encourage chest abdominal/pelvic CT ± MRI brain, and/or PET as clinically indicated (recurrence)

Multiple Myeloma (v.2.2009)

a. Initial workup: PET/CT scan (useful under some circumstances) (staging)
b. Solitary osseous and solitary extraosseous: consider MRI and or CT and or PET/CT as clinically indicated or every 6-12 months (follow-up/surveillance)
c. Smoldering (asymptomatic) or stage I myeloma, and active (symptomatic) all other stages of myeloma: consider PET/CT scan (follow-up/surveillance)
d. Active (symptomatic) myeloma: response after induction chemotherapy: consider PET/CT scan (follow-up/surveillance)

Myelodysplastic Syndromes (v.1.2009): No PET

Neuroendocrine Tumors (v.1.2008): No PET

a. "The standard PET tracer, 18F-fluorodeoxyglucose, is not useful in identifying neuroendocrine tumors".
b. Initial work-up: octreotide scan, bone scan if symptoms

Non-Hodgkin's Lymphomas (v.3.2008)

a. CLL/SLL: No PET
b. Follicular lymphoma (grade 1-2): PET or PET/CT scan useful in certain cases (staging, restaging)
c. Gastric MALT lymphoma: No PET
d. Nongastric MALT lymphoma: PET or PET/CT scan useful in certain cases (staging, restaging)
e. Nodal marginal cell lymphoma: PET or PET/CT scan useful in certain cases (staging, restaging)
f. Splenic marginal cell lymphoma: PET or PET/CT scan useful in certain cases (staging, restaging)
g. Mantle cell lymphoma: PET or PET/CT scan useful in certain circumstances (staging, restaging)
h. Diffuse large B-cell lymphoma: PET or PET/CT essential (staging, restaging)
i. Burkitt's lymphoma: No PET
j. Lymphoblastic lymphoma: No PET
k. AIDS related B-cell lymphoma: PET or PET/CT scan useful in selected cases (staging, restaging)
l. Peripheral T-cell lymphoma: PET or PET/CT scan useful in selected cases (staging, restaging)
m. Mycosis Fungoides/Sezary syndrome: neck/chest/abdominal/pelvic contrast enhanced CT or integrated whole body PET/CT essential (staging, restaging)

Non-melanoma Skin Cancers (v.1.2009)

a. Basal and squamous cell skin cancers: No PET
b. Dermatofibrosarcoma protuberans: No PET
c. Merkel cell carcinoma
    1. Initial work-up: Imaging (CT, MR, or PET) may beindicated to evaluate for the possibility of a skin metastasis from a noncutaneous primary neuroendocrine carcinoma (eg, small cell lung cancer), especially in cases where CK-20 is negative (diagnosis)
    2. Clinical node positive: Imaging (CT, MR, or PET) may be indicated to evaluate extent of lymph node and/or visceral organ involvement (staging)

Non-Small Cell Lung Cancer (v.2.2009)

a. Initial workup stage I-IV (M1 solitary metastasis): PET/CT scan (staging)
b. Radiation treatment planning: PET/CT is preferable to CT alone for the GTV determination in cases with significant atelectasis (staging)

Occult Primary (v.1.2009)

a. Initial workup of suspected metastatic malignancy: PET/CT scan (routine use is not recommended before establishing a diagnosis of malignancy) (diagnosis, staging)
b. Neuroendocrine tumor, specific cell type unknown: chest/abdominal/pelvic CT, bone scan, octreotide scan, PET scan (optional) (diagnosis, staging)

Ovarian Cancer (v.1.2008)

a. Stage I-IV complete response: chest/abdominal/pelvic CT or PET as clinically indicated (monitoring/follow-up)
b. Rising CA-125 no previous chemotherapy, or clinical relapse no previous chemotherapy: Imaging studies: chest/abdominal/pelvic CT, MRI, PET or PET/CT (category 2B) as clinically indicated (recurrence)

Pancreatic Adenocarcinoma (v.1.2008): No PET

Prostate Cancer (v.1.2009): No PET

Small Cell Lung Cancer (v.2.2009)

a. Initial workup: PET scan (optional). PET scan can be used as part of the initial evaluation, in addition to the other recommended studies (staging)

b. Clinical stage T1-2, N0: PET scan to identify distant disease and to guide mediastinal evaluation (staging)
c. Carcinoid and atypical carcinoid: PET scan (optional). PET scan is undergoing evaluation in clinical trials and should only be considered as a supplement and not a replacement to other studies (staging)

Soft Tissue Sarcoma (v.2.2008)

a. Extremity: Under certain circumstances, PET may be useful in prognostication, grading, and determining response to therapy (diagnosis, staging, therapy response)
b. Retroperitoneal/Abdominal: No PET
c. Gastrointestinal Stromal Tumor (GIST):
    1. Marginally resectable or resectable with risk of considerable morbidity: Consider PET (staging); consider PET after 2-4 weeks of imatinib mesylate (therapy response)
    2. Definitely unresectable or metastatic disease: Consider baseline PET, if using PET during follow-up (staging); Assess therapeutic effect of imatinib mesylate within 3 months using CT ± PET (therapy response)
    3. Progression: Increase imatinib dose or change to sunitinib; reassess therapeutic response with PET or CT (therapy response)
d. Intra-abdominal Sarcomas other than GIST: No PET
e. Desmoid Tumors: No PET

Testicular Cancer (v.2.2009)

a. Seminoma
    1. Stage IIB, IIC, III after orchiectomy and primary treatment with chemotherapy – residual mass and normal tumor markers: PET scan preferred (recurrence); if PET scan negative, follow-up PET scan as clinically indicated (recurrence)
b. Nonseminoma: No PET (see note)

Note: "There is limited predictive value for PET scan for residual masses"

Thymic Malignancies (v.2.2009)

a. Mediastinal mass: FDG-PET and radiolabeled octreotide scan optional (diagnosis, staging)

Thyroid Carcinoma (v.1.2008)

a. Papillary Carcinoma: Consider nonradioiodine imaging (eg FDG PET ± CT if Tg ≥ 10 ng/mL) if I-131 scans are negative and stimulated Tg > 2-5 ng/mL (recurrence)
b. Follicular Carcinoma: Consider nonradioiodine imaging (eg FDG PET ± CT if Tg ≥ 10 ng/mL) if I-131 scans are negative and stimulated Tg > 2-5 ng/mL (recurrence)
c. Hurthle Cell Carcinoma: Consider nonradioiodine imaging (eg FDG PET ± CT if Tg ≥ 10 ng/mL) if I-131 scans are negative and stimulated Tg > 2-5 ng/mL (recurrence)
d. Medullary Carcinoma: No PET
e. Anaplastic Carcinoma: No PET

Uterine Neoplasms (v.1.2008)

a. Endometrial Carcinoma: No PET
b. Uterine Sarcoma: No PET