BC Cancer Guidelines for FDG-PET/CT Imaging in Adult Oncology Patients

Breast Carcinoma

1. Evaluation of possible metastases when it cannot otherwise be confirmed and patient management would be significantly influenced (e.g. equivocal conventional imaging studies and clinical suspicion or laboratory evidence of recurrence with negative conventional imaging).
2. Evaluation of response to therapy if it cannot be determined by other means and would significantly impact patient management.
3. Staging in high risk patients (locally advanced/inflammatory) who are candidates for neoadjuvant chemotherapy.

NOTE: No defined indications in screening, routine evaluation of primary breast cancer, initial staging of axillary lymph nodes or in the routine assessment of response.

Central Nervous System

1. Evaluation of recurrent brain tumor versus post-treatment necrosis.

Gastrointestinal (esophagus, colorectal, anal)

Esophageal/Gastroesophageal Junction

1. Base-line evaluation of medically fit patient considered eligible for surgical esophagectomy.
2. Evaluation of neoadjuvant or peri-operative therapy for patient deemed eligible for radical resection of residual disease.

Gastric

1. Consider in select cases depending on histology – diffuse subtype and signet cell pathology have a higher false negative rate – can consider in cases with borderline lymph nodes to determine surgical candidate or local regional treatment.

Pancreas

1. Staging for patients undergoing curative resection or localized therapy to the pancreas.

Cholangiocarcinoma

1. Differentiation of benign from malignant disease in patients where conventional imaging or cytology is equivocal and there is a clinical suspicion of malignancy for patient undergoing surgery or local regional treatment or transplant.

Hepatocellular carcinoma

1. Consider in patients for transplant or determination of curable resection/ local regional options.

Colorectal Carcinoma

1. Determination of stage in patient with potentially resectable recurrence or de novo metastatic disease.
2. Suspected recurrence with rising CEA with negative CT findings
3. Pre- and post-surgical metastatic assessment.
4. Determination of peri-operative treatment response in patients being considered for R0-intent resection.
5. Guide radiotherapy treatment planning.
6. Following initial therapy, for evaluation of suspected residual, metastatic or recurrent colorectal ca in the setting of an equivocal CT finding.

Anal Carcinoma

1. Initial Staging of Anal Cancer with enlarged pelvic or inguinal lymph nodes suspicious for metastases.
2. Assessment of response to treatment 12 weeks after completion.

Gynecologic

Cervical Cancer

1. Staging prior to radical intent treatment in FIGO 2018 IBS- IV disease.
2. Restaging prior to exenterative surgery.
3. Reasonable to consider at 3 to 6 months following radical chemoradiotherapy

Vaginal Cancer

1. Staging prior to any radical intent treatment.
2. Restaging prior to any exenterative surgery
3. Consider at 3 to 6 months following chemoradiotherapy for locally advanced disease

Vulvar Cancer

1. Staging prior to radical intent treatment in cases of gross nodal disease or known positive grin nodes or T3 tumors.

Endometrial Cancer

1. Evaluation of suspicious lymph node or distant metastases seen on staging CT/MRI.
2. Prior to radical intent treatment (radiotherapy or surgical exenteration) for recurrent disease in grade 2, 3 endometrial carcinoma or clear cell/serous carcinoma. Not recommended in grade 1 disease.

NOTE: No defined indications in ovarian cancers

Head and Neck Cancer (non-CNS, non-thyroid)

1. Primary unknown squamous cell carcinoma metastatic to neck.
2. For staging H&N cancers when other imaging modalities yield equivocal results or for stage 3/4 tumours for which treatment is being considered.
3. For planning treatment when other imaging methods cannot be used to satisfactorily delineate the tumour volume and RT is being considered.
4. After treatment when there is a complete clinical response.
5. Diagnosis of suspected recurrence in the absence of other definitive evidence in patients being considered for salvage therapy.
6. Restaging of residual neck masses in patients with head and neck cancers following definitive treatment.

Lung

1. Evaluation of new or growing solid lung nodule in patient who cannot undergo biopsy.
2. Evaluation of growing ground glass nodules in patients who cannot under biopsy.
3. Evaluation of nodule in which biopsy was non-diagnostic.
4. Staging NSCLC prior to curative intent treatment (surgery, chemoRT, SABR) to rule out metastatic disease for suspected stage I-IIIB disease.
5. Repeat staging of NSCLC prior to curative intent treatment if last PET was > 3mo ago.
6. Staging for suspected oligometastatic disease either prior to curative intent treatment, or prior to ablative treatment to metastases (SABR or RFA).
7. Repeat staging post induction chemo or CRT prior to surgical resection for curative intent (most common in stage III disease).
8. Staging SCLC prior to curative intent treatment in patients with suspected limited stage disease.
9. For any patient on surveillance or active treatment if characterization of non-specific CT findings would lead to a change in management.

Lymphoma

1. Initial staging for curable aggressive Non- Hodgkin's Lymphoma
   -diffuse large B-cell lymphoma - all sub-types including primary mediastinal B cell lymphoma.
   -peripheral T-cell lymphoma, including specified and unspecified subtypes
   -follicular lymphoma grade 3B
2. Initial staging for Hodgkin's Lymphoma.
3. Interim response evaluation for limited stage (IA or IIA, non-bulky) diffuse large B-cell lymphoma, (all subtypes, including primary mediastinal B- cell lymphoma), and follicular lymphoma grade 3B, following 3 cycles of R-CHOP to plan remaining treatment.
4. Interim response evaluation (interim scan) for limited stage (IA or IIA, non-bulky) Hodgkin's lymphoma following 2 cycles of ABVD to plan remaining treatment.
5. Interim response evaluation (interim scan) for advanced stage (stages 3 or 4, or 1 or 2 with bulky disease, or stage 2 with B symptoms) Hodgkin's lymphoma following 2 cycles of ABVD to plan remaining treatment.
6. To complete staging in pts with localized low grade NHL, stage I and IIA, in which curative radiation is being considered.
7. Post-chemotherapy for patients with advanced stage curable aggressive non-Hodgkin lymphoma (diffuse large B-cell lymphoma, all sub-types including primary mediastinal B-cell lymphoma; peripheral T-cell lymphoma, including specified and unspecified subtypes) and Hodgkin lymphoma with residual CT abnormalities ≥ 2 cm to assess need for radiation therapy.
8. Diagnosis of suspected recurrence in Hodgkin's or aggressive Non- Hodgkin's Lymphoma.
9. When there is clinical or radiological suspicion of transformation of an indolent lymphoma to an aggressive form.
10. Following discussion at a Multidisciplinary team meeting there may a role for imaging of other low grade lymphomas in selected cases (see below).

Not indicated for routine staging indolent non-Hodgkin lymphomas known to be non-FDG-avid, including; chronic lymphoid leukemia/small lymphocytic lymphoma, lymphoplasmacytic lymphoma (Waldenstrom's disease), marginal zone lymphomas, and mycosis fungoides.

Melanoma

1. Initial staging of patients with Stage III disease for whom radical surgery is planned.
2. Evaluation of patients with Stage IV disease (initial or recurrent) to assess extent of disease.
3. Malignant melanoma in whom a sentinel node biopsy was not or cannot be performed in Stage II.

4. For evaluating the therapeutic response to surgery (metastasectomy), chemotherapy or immunotherapy, if the result is likely to lead to a change in the therapeutic approach.
5. For restaging of local recurrence when surgical treatment is being considered.
6. Prior to radical resection for mucosal melanoma.

Mesothelioma

Staging prior to surgical resection in medically fit patient.

Multiple Myeloma

1. Evaluation of patients newly diagnosed with solitary plasmacytoma to exclude multiple myeloma.
2. To distinguish between symptomatic and indolent forms of myeloma if conventional bone imaging findings are doubtful or negative, or if there is clinical suspicion, or if whole body MRI is unavailable.
3. To assess response to treatment of non-secretory or oligosecretory myeloma.

Neuroendocrine Tumours

In selected cases prior to consideration of PRRT or staging in the setting of high grade disease or neuroendocrine carcinoma.

Penile Carcinoma

Staging of high risk penile carcinoma.

Sarcoma

1. Evaluation of primary soft tissue mass prior to biopsy to identify high grade areas and guide biopsy.
2. Staging of locally advanced (10 cm or greater in maximum dimension) high grade soft tissue sarcomas.
3. Staging of Ewing's sarcoma, rhabdomyosarcoma and osteosarcoma in adults.
4. To plan for surgical or curative intent radiation treatment in high grade sarcomas such as Ewing sarcoma or rhabdomyosarcoma.

5. Evaluating response to treatment in patients with Ewing's sarcoma or rhabdomyosarcoma.
6. Lymph node staging in patients who have sarcomas at higher risk for nodal metastases (epithelioid, synovial, clear cell)
7. Detection of suspected local recurrence of soft tissue sarcoma after definitive treatment.
8. Evaluating early response of gastrointestinal stromal tumors (GIST) to treatment with imatinib mesylate.

Testicular Carcinoma (seminomatous germ cell tumors)

1. As an adjunct to initial staging of patients with Stage II seminomatous (SGCT).
2. Post-treatment evaluation of residual masses.
3. Detection of recurrent disease in the setting of rising tumor markers and absence of radiologic evidence of disease.

Thymoma/Thymic Carcinoma

1. Staging prior to curative intent treatment.
2. Re-staging prior to surgical or ablative treatment for an oligometastatic deposit.
3. For patients on surveillance or active treatment only if characterization of non- specific CT findings would lead to a change in management.

Thyroid Carcinoma

1. Detection of suspected recurrence post-definitive therapy based on rising thyroglobulin levels in the setting of a negative radio-iodine study (papillary and follicular carcinomas).
2. Staging of histologically confirmed anaplastic carcinoma, poorly differentiated thyroid cancer or Hurthle cell carcinoma.

NOTE: No defined indication in the evaluation of thyroid nodules or initial assessment or follow-up of differentiated thyroid cancer.

Other cancers given specific clinical indications, as approved by BC Cancer on an individual basis.

It is recognized in clinical practice that there may be clinical scenarios that do not meet specific guidelines but where expert medical opinion suggests that PET/CT results could have a major impact on patient management. PET/CT scan referrals in these cases will be reviewed on an individual basis.