PET Scans Ontario Indications List

For the most up-to-date indications information, please visit www.CCOHealth.ca/PET.

This document provides a high-level overview of funded indications. As with all testing, there may be additional criteria impacting individual patient eligibility. Contact your PET centre of choice for more information.

Not all indications are available at all PET Centres. Contact PET Scans Ontario (1-877-473-8411) or your PET centre of choice if you have questions.

Indications refer to 18F-Fluourodeoxyglucose (FDG)-PET scanning, unless otherwise specified.

For patients who may benefit from a PET scan, but do not meet the eligibility criteria to receive a PET scan for one of the listed indications, referring physicians may wish to apply for a PET scan for their patient through the PET Access Program.

Category **Page**

Cardiology……Cardiac FDG PET Requisition

Current Indications/Recommendations:

- Myocardial Viability

  Eligibility Criteria:
  PET in a patient suitable for a cardiac revascularization procedure or cardiac transplantation with moderate to severe ischemic left ventricular dysfunction (left ventricular ejection fraction of 40% or less) despite maximal therapy; **and** prior myocardial viability or myocardial perfusion assessment (i.e. dobutamine stress echocardiography, exercise or pharmacologic stress SPECT or PET) has been equivocal for viability or demonstrated insufficient viable myocardium, **or** a patient with severe ischemic left ventricular dysfunction and known multi-vessel coronary disease (determined by coronary angiography) who urgently requires an assessment of myocardial viability.

- Cardiac Sarcoidosis

  Eligibility Criteria:
  PET for the diagnosis and clinical management of patients with suspected or diagnosed cardiac sarcoidosis.

  - Biopsy proven or clinical diagnosis of pulmonary or systemic sarcoidosis and in whom obstructive coronary disease has been ruled out.
    Note: Perfusion/FDG PET imaging may not be able to distinguish between cardiac sarcoidosis scar and inflammation from hibernating myocardium. This should be considered when ordering the test and interpreting the results.

    - Supporting documents must include of positive biopsy or clinical consult demonstrating pulmonary or systemic sarcoid. **AND one or more *abnormal* initial screening tests to screen for cardiac involvement.** An Abnormal screening test is defined as **one or more** of the following:
      - abnormal ECG defined as complete left or right bundle branch block and/or presence of unexplained pathological Q waves in 2 or more leads
      - abnormal echo defined as RWMA and/or wall aneurysm and/or basal septum thinning and/or LVEF < 50%
      - abnormal Holter defined as sustained or nonsustained VT
      - cardiac MRI suggestive of cardiac sarcoid

  - Young patients with unexplained new onset conduction system disease.
    - Defined as sustained Mobitz II 2nd degree or 3rd degree AV block

  - Patients with idiopathic sustained ventricular arrhythmias, to screen for CS as underlying etiology

    idiopathic VT is defined as VT **not** fulfilling any of following criteria
    - Typical outflow tract VT
    - Fascicular VT
    - VT secondary to other structural heart disease (coronary artery disease, any cardiomyopathy other than idiopathic).

  - Surveillance of patients with proven cardiac Sarcoid to follow response to treatment with steroids and/or immunosuppressants.

- Patients undergoing 3 or more FDG PET scans to assess response to therapy will have PET scan series reviewed by expert PET reviewer and Cardiac Sarcoid Specialist.

- Cardiomyopathy & Ventricular Arrhythmia

  Eligibility Criteria:
  PET for the diagnosis and clinical management of patients with unexplained cardiomyopathy and associated ventricular tachycardia or fibrillation
  - Ventricular arrhythmia in the setting of unexplained cardiomyopathy, despite adequate investigation, including referral/consultation with an EP (electrophysiology) specialist.

- Device Infections

  Eligibility Criteria:
  PET for the diagnosis and clinical management of patients with suspected infection of pacemaker, ICD, CRT where there is a high clinical suspicion and/or laboratory evidence of infection.
  - Suspected generator or pocket infection without endovascular lead infection
  - Suspected endovascular lead infection without generator pocket infection
  - Suspected generator pocket infection and endovascular lead infection
  - Suspected extra-cardiac complications (i.e. septic emboli)

- Infective Endocarditis

  Eligibility Criteria:
  PET for the diagnosis and clinical management of patients where, using modified Duke criteria there is a high clinical suspicion and/or laboratory evidence of infection.
  - Possible infective endocarditis
  - Rejected infective endocarditis (according to modified Duke Criteria), but clinical suspicion is high
  - Definite infective endocarditis with:
    - Suspicion of extra-cardiac complications (i.e. septic emboli)
    - Suspicion of cardiac complications (e.g. perivalvular abscess)

- Inflammation/Myocarditis

  Eligibility Criteria:
  PET for the diagnosis and clinical management of patients where there is a high clinical suspicion and/or laboratory evidence of myocarditis
  - Recurrent myocarditis/symptoms despite adequate treatment of the initial episode
  - Lack of left ventricular function recovery
    - Troponin elevation out of keeping with the diagnosis of myocarditis

- Pericarditis

  Eligibility Criteria:
  PET for the diagnosis and clinical management of patients where there is a high clinical suspicion or lab evidence of pericarditis.
  - Persistent symptoms despite 2 weeks of adequate therapy
  - Recurrent pericarditis/symptoms despite adequate treatment of the initial episode
  - Assess response to therapy 4 weeks after therapy initiation

- Vasculitis/Aortitis

  Eligibility Criteria:
  PET for the diagnosis and determination of clinical management of patients where there is a high clinical suspicion and/or laboratory evidence of vasculitis/aortitis.
  - Evaluate suspected vasculitis to determine extent and distribution of disease activity
  - To monitor effects of therapy where conventional investigations are equivocal or insufficient
  - Where treatment would be altered if ongoing inflammatory disease is confirmed or ruled out.

- Other Inflammatory Processes

  Eligibility Criteria:
  PET for the evaluation of patients with suspicion of cardiac inflammatory processes (i.e., multiple differential inflammatory diagnoses based on MRI/CT imaging). Compelling evidence may be submitted via the Cardiac PET Special Access Program.

- Myocardial Perfusion (**Rb-PET**)

  Eligibility Criteria:
  Stress PET for the assessment of patients with known or suspected coronary artery disease (CAD) with an intermediate (10-90%) pre-test likelihood of significant ischemia secondary to coronary stenosis where:
  - there is a high likelihood of attenuation artifact with SPECT imaging, or
  - a high degree of functional accuracy or quantitative flow measurements is required, or
  - functional imaging is required and a low radiation dose is preferable (such as younger patients), or
  - the results of prior non-invasive imaging are equivocal or inconclusive, or
  - in patients with known CAD where the need for intervention is uncertain.

  Quantitative PET flow imaging may be particularly helpful when there is a need for absolute MBF measurements, such as:
  - Patients without known CAD who present with symptoms suspect for ischemia.
  - Patients with known CAD,where specific physiological assessment is desired.
  - Identifying patients with an increased suspicion for multivessel CAD.
  - To assess possible microvascular dysfunction.
  - Heart transplant patients when there is a question of vasculopathy.

Neurology/Dementia

Current Indications/Recommendations:

- Epilepsy – medically-intractable……Epilepsy PET Registry Form

  Eligibility Criteria:
  PET for patients with medically-intractable epilepsy being assessed for epilepsy surgery

- Paraneoplastic Syndrome……PNS Expedited PET Access Request Form

  Eligibility Criteria:
  PET for the evaluation of patients with suspected paraneoplastic neurologic syndromes with negative conventional imaging, with or without positive onconeuronal antibodies

Oncology

Breast Cancer

Current Indications/Recommendations:

- Advanced Breast Cancer……PET ABC Trial

  Eligibility Criteria:
  PET for the staging of patients with clinical stage III breast cancer; for more information on how to enrol your patient, please visit: https://www.clinicaltrials.gov/ct2/show/NCT02751710

Dermatology……Melanoma PET Request Form

Current Indications/Recommendations:

- Melanoma (Staging)

  Eligibility Criteria
  PET for the staging of patients with localized "high risk" melanoma, or for the evaluation of patients with isolated melanoma metastases when surgery or other ablative therapies are being considered

- Metastatic Melanoma (Immunotherapy)

  Eligibility Criteria
  - Baseline Staging: PET for the staging of patients prior to starting immunotherapy
  - Early Response Assessment: PET after 2-4 cycles of immunotherapy for early response assessment of patients with metastatic melanoma currently receiving immunotherapy
  - End of Therapy Response Assessment: PET for response assessment of patients with metastatic melanoma at end of immunotherapy

Gastrointestinal (GI) Cancers……GI PET Request Form

Current Indications/Recommendations:

- Esophageal/GE Junction

  Eligibility Criteria
  PET for baseline staging assessment of those patients diagnosed with esophageal/GE Junction cancer being considered for curative therapy and/or repeat PET/CT scan on completion of pre-operative/ neoadjuvant therapy, prior to surgery; or for re-staging of patients with locoregional recurrence, after primary treatment, being considered for definitive salvage therapy.

- Colorectal (apparent limited metastatic)

  Eligibility Criteria:
  PET for the staging/re-staging for patients with apparent limited metastatic disease (e.g., organ-restricted liver or lung metastases); or limited local recurrence, who are being considered for radical intent therapy
  Note: *as chemotherapy may affect the sensitivity of the PET scan, it is strongly recommended to schedule PET at least 6 weeks after last chemotherapy, if possible.*

- Colorectal (recurrent)

  Eligibility Criteria:
  PET where recurrent disease is suspected on the basis of an elevated and/or rising carcinoembryronic antigen (CEA) level(s) during follow-up after surgical resection but standard imaging tests are negative or equivocal.

- Anal Canal (staging/restaging)

  Eligibility Criteria:
  PET for the initial staging of patients with T2-4 (or node positive) squamous cell carcinoma of the anal canal with or without evidence of nodal involvement on conventional anatomical imaging.

Genitourinary (GU) Cancers

Current Indications/Recommendations:

- Bladder (Muscle Invasive)……PET MUSE Trial

  Eligibility Criteria:
  PET for the staging of patients with muscle-invasive urothelial carcinoma of the bladder; for more information on how to enrol your patient, please visit: https://www.clinicaltrials.gov/ct2/show/NCT02462239

- Germ Cell Tumours (recurrent/persistent disease)……..GU PET Request Form

  Eligibility Criteria:
  - PET where recurrent disease is suspected on the basis of elevated tumour marker(s) - (beta human chorionic gonadotrophin (HCG) and/or alpha fetoprotein) and standard imaging tests are negative; OR
  - Where persistent disease is suspected on the basis of the presence of a residual mass after primary treatment for seminoma when curative surgical resection is being considered

- Prostate (recurrent) (**PSMA PET**)……PET PREP Request Forms
  Forms: PET PREP Request Form + Eligibility Form A + Consent Form +
  PREP Access Request Form for Cohort 7 patients

  Eligibility Criteria:
  Prostate Specific Membrane Antigen (PSMA) PET in the following patient populations with recurrent prostate cancer:
  - Post-prostatectomy node positive disease or persistently detectable PSA
  - Biochemical failure post-prostatectomy
  - Biochemical failure following radical prostatectomy followed by adjuvant or salvage radiotherapy
  - Rising PSA post-prostatectomy despite salvage hormone therapy
  - Biochemical failure following treatment for oligometastatic disease
  - Biochemical failure following primary radiotherapy
  - Where confirmation of site of disease and/or disease extent may impact clinical management over and above the information provided by conventional imaging (requires a case-by-case review)

Gynecological Cancers……Gynecology PET Request Form

Current Indications/Recommendations:

- Cervical Cancer (staging)

  Eligibility Criteria:
  PET for the staging of locally advanced cervical cancer when:
  - CT/MR shows positive or indeterminate pelvic nodes (>7mm and/or suspicious morphology) OR
  - CT/MR shows borderline or suspicious para-aortic OR
  - CT/MR shows suspicious or indeterminate distant metastases (e.g., chest nodules)

- Gynecology (recurrent, prior to salvage therapy)

  Eligibility Criteria:
  PET for re-staging of patients with recurrent gynecologic malignancies under consideration for radical salvage surgery (e.g., pelvic exenteration)

Head & Neck (H&N) Cancers.....H&N PET Request Form

Current Indications/Recommendations:

- Unknown Primary

  Eligibility Criteria:
  PET for the evaluation of metastatic squamous cell carcinoma in neck nodes when the primary disease site is unknown after standard radiologic and clinical investigation
  Note: *a panendoscopy is NOT required prior to the PET scan*

- Nasopharyngeal (baseline staging)

  Eligibility Criteria:
  PET for the staging of nasopharyngeal cancer
  Note: *for cervical esophageal cancer, see Gastrointestinal Cancers.*

- H&N Node Positive (baseline staging)

  Eligibility Criteria:
  PET for the baseline staging of node positive (N1-N3) H&N cancer where PET will impact radiation therapy (e.g., radiation volume / dose)

- H&N (re-staging after chemoradiotherapy)

  Eligibility Criteria:
  PET to assess patients with N1-N3 metastatic squamous-cell carcinoma of the H&N after chemoradiation (HPV negative); or who have residual neck nodes ≥ 1.5cm on re-staging CT performed 10-12 weeks post therapy (HPV positive).

- Thyroid (recurrent)

  Eligibility Criteria:
  PET where recurrent or persistent disease is suspected on the basis of elevated and/or rising tumour markers (e.g., thyroglobulin) with negative or equivocal conventional imaging work-up.

- Anaplastic Thyroid (staging)

  Eligibility Criteria:
  PET for the staging of histologically proven anaplastic thyroid cancer with negative or equivocal conventional imaging work-up.

- Medullary Thyroid (staging & recurrent)

  Eligibility Criteria:
  PET for the baseline staging of histologically proven medullary thyroid cancer being considered for curative intent therapy or where recurrent disease is suspected on the basis of elevated and/or rising tumour markers (e.g., calcitonin) with negative or equivocal conventional imaging work-up.

- Esophageal/GE Junction

  Eligibility Criteria

  PET for baseline staging assessment of those patients diagnosed with esophageal/GE Junction cancer being considered for curative therapy and/or repeat PET/CT scan on completion of pre-operative/ neoadjuvant therapy, prior to surgery; or for re-staging of patients with locoregional recurrence, after primary treatment, being considered for definitive salvage therapy.

Hematological Cancers

Current Indications/Recommendations:

- Lymphoma ……Lymphoma PET Request Form

  Eligibility Criteria:
  - Staging: PET for the baseline staging of patients with Hodgkin's or non-Hodgkin's lymphoma
  - Interim Response Assessment:
    - Adults (≥18 years old): PET for the assessment of response in Hodgkin's lymphoma following two (2) or three (3) cycles of chemotherapy when curative therapy is being considered.
    - Pediatric (<18 years old; or ≤20 years old and treated at a pediatric centre): PET for the assessment of response in Hodgkin's or non-Hodgkin's lymphoma after a minimum of two (2) cycles of chemotherapy when curative therapy is being considered.
  - End of therapy response assessment: PET for the evaluation of residual mass(es) or lesion(s) (e.g., bone) following chemotherapy in a patient with Hodgkin's or non-Hodgkin's lymphoma when further potentially curative therapy (such as radiation or stem cell transplantation) is being considered

- Myeloma/Plasmacytoma……..MM/Plasmacytoma PET Registry Request Form

  Eligibility Criteria:
  To evaluate the impact of PET on the management of patients with plasmacytoma/myeloma for the following indications:
  - Solitary plasmacytoma: for patients with presumed solitary plasmacytoma who are candidates for curative intent radiotherapy [to determine whether solitary or multifocal/extensive disease]
  - Smoldering myeloma: Workup of patients with smoldering myeloma and negative or equivocal skeletal survey [to determine whether smoldering or active myeloma]
  - Nonsecretory myeloma, oligosecretory myeloma, or POEMS: Baseline staging and response assessment.
  - Newly-Diagnosed Secretory Multiple Myeloma: Workup of patients with newly-diagnosed secretory multiple myeloma and negative or equivocal skeletal survey

Neuroendocrine Tumours (NETs)

Current Indications/Recommendations:

- Neuroendocrine Tumours (**Ga68-DOTATATE PET**)……PET NET Request Form

  Eligibility Criteria:
  - Diagnosis: PET for identification of primary tumour when there is clinical suspicion of NET and primary tumour site is unknown or uncertain. Patients should have no definitive evidence of disease on CT and elevated biochemical markers (e.g., 5-HIAA ± Chromogranin A).
  - Initial Staging: PET for the staging of patients upon initial diagnosis of NET
  - Re-staging: PET for the re-staging of patients with NET when surgery (e.g., de-bulking, focal ablation, livery directed therapy or PRRT is being considered; OR where conventional imaging is negative or equivocal at tie of clinical and/or biochemical progression
  - Other: PET as a problem-solving tool in patients with NET when confirmation of site of disease and/or disease extent may impact clinical management (requires case-by-case review)

Sarcoma……Sarcoma Registry Request Form

Current Indications/Recommendations:

- Diagnosis (Plexiform Neurofibromas)

  Eligibility Criteria:
  PET for patients with suspicion of malignant transformation of plexiform neurofibromas

- Initial Staging

  Eligibility Criteria:
  PET in patients with high grade (≥ Grade 2), or ungradable, soft tissue or bone sarcomas, with negative or equivocal findings for nodal or distant metastases on conventional imaging, prior to curative intent therapy

- Re-staging

  Eligibility Criteria:
  PET in patients with history of treated sarcoma with suspicion of, or confirmed, recurrent sarcoma (local recurrence or limited metastatic disease) being considered for curative intent or salvage therapy

Thoracic Cancers……Thoracic PET Request Form

Current Indications/Recommendations:

- Esophageal/GE Junction

  Eligibility Criteria
  PET for baseline staging assessment of those patients diagnosed with esophageal/GE Junction cancer being considered for curative therapy and/or repeat PET/CT scan on completion of pre-operative/ neoadjuvant therapy, prior to surgery; or for re-staging of patients with locoregional recurrence, after primary treatment, being considered for definitive salvage therapy.

- Lung – Non-Small Cell Lung Cancer (NSCLC; Clinical Stage I-III)

  Eligibility Criteria
  PET for initial staging of patients with NSCLC (Clinical Stage I – III) being considered for potentially curative therapy; OR for re-staging of patients with locoregional recurrence, after primary treatment, being considered for definitive salvage therapy
  Note: *Histological proof is not required prior to PET if there is high clinical suspicion for NSCLC (e.g., based on patient history and/or prior imaging)*
  Note: *PET is appropriate for patients with either histological proof of locoregional recurrence or strong clinical and radiological suspicion of recurrence who are being considered for definitive salvage therapy*

- Lung – Small Cell Lung Cancer (SCLC; Clinical Stage I-III)

  Eligibility Criteria
  PET for initial staging of patients with limited disease SCLC where combined modality therapy with chemotherapy and radiotherapy is being considered

- Lung – Solitary Pulmonary Nodule (SPN)

  Eligibility Criteria
  PET for a **semi-solid or solid** lung nodule for which a diagnosis could not be established by a needle biopsy due to unsuccessful attempted needle biopsy; the SPN is inaccessible to needle biopsy; or the existence of a contra-indication to the use of needle biopsy

- Lung – Mesothelioma

  Eligibility Criteria
  PET for the staging of patients with histologic confirmation of malignant mesothelioma

Pediatric Oncology

Current Indications/Recommendations:

- Pediatric Oncology Registry…… PET Scans Ontario eTool online request

  Eligibility Criteria

  Pediatric Registry Indications (data collection/partnership with POGO):

  - For the following cancer types (ICCC)
    - Bone/Cartilage - Osteosarcoma, Ewings sarcoma
    - Connective/Other soft tissue - Rhabdomyosarcoma, Other
    - Kidney - Renal Tumour
    - Liver - Hepatic Tumour
    - Lymphoma/PTLD – **See Hematological Oncology Section**……..Page 11
    - Primary Brain - Astrocytoma, Medulloblastoma, Ependymoma, Other
    - Reproductive - Germ Cell Tumour
    - Sympathetic Nervous System - Neuroblastoma MIBG negative
    - Other – LCH, Melanoma of the Skin, Thyroid
  - For the following indications
    - Initial Staging
    - Monitoring response during treatment/determine response-based therapy
    - Rule out progression prior to further therapy
    - Suspected recurrence/relapse
    - Rule out persistent disease
    - Select optimal biopsy site