KAISER PERMANENTE® Mid-Atlantic States	**Positron Emission Tomography Computed Tomography (PET- CT) Non-Oncology Use** **Medical Coverage Policy**

2025 New Policy

UTILIZATION * ALERT*

- Prior to use of this MCP for evaluation of medical necessity, benefit coverage MUST be verified in the member's EOC or benefit document.
- For Medicare members, please consult the Medicare Coverage Database.
- Note: After searching the Medicare Coverage Database, if no NCD/LCD/LCA is found, then use the policy referenced above for coverage guidelines

I. **Procedure: Positron Emission Tomography Computed Tomography (PET- CT), Non-Oncology Use**

II. Overview

Positron Emission Tomography Computed Tomography (PE-CT) scan, combines two nuclear imaging techniques, to provide highly detailed images of the body's anatomy and function, to identify/detect, diagnose/stage malignancy, and monitor/assess treatment response/effectiveness. PET-CT is medically appropriate for oncology and non-oncology use through the use of radioactive tracer: fluorodeoxyglucose (FDG) or non-FDG tracer.

III. **Scope:**

This policy is limited to the non-oncology application of PET-CT. Please refer to related policy when addressing the oncology application of PET-CT.

Related policy:
Positron Emission Tomography Computed Tomography (PET- CT), Oncology Use

IV. Clinical Indication

Fluorodeoxyglucose (FDG) Tracer PET-CT is medically necessary when the patient meets the criteria for the following non-oncology use:

A. Fever of unknown origin

1. To identify the cause of pyrexia of unknown origin when conventional tests have not revealed a source

B. Vasculitis

1. Suspected vasculitis/aortitis

For the diagnosis and determination of clinical management when there is a high clinical suspicion (including elevated inflammatory biomarker with negative imaging or biopsy workup and/or laboratory evidence) of vasculitis/aortitis, such as large vessel vasculitis (LVV) or Polymyalgia Rheumatica (PMR) with any the following objective:

a. To determine the presence, extent and distribution of active extracranial disease when medium or large vessel vasculitis is suspected; or
b. For confirmation of active extracranial vascular disease when vasculitis is clinically suspected but conventional imaging (CT angiography, magnetic resonance angiography or ultrasonography) is negative; or
c. For differential diagnosis of other pathological processes that can result in atypical clinical presentation mimicking vasculitis, such as multisystemic inflammatory disease, infection, malignancies and potential paraneoplastic phenomenon.

2. **Suspected vasculitis relapse** (vasculitis-related inflammation of the aorta and/or its proximal branches) during glucocorticoid taper and/or immunosuppressive therapy.

C. Infection and Inflammatory Disorders (excluding Sarcoidosis and Vasculitis)

1. Soft tissue and bone infections in the feet of patients with diabetes mellitus;
2. To detect the focal site(s) of infection in immunocompromised patients;
3. Suspected multi-resistant tuberculosis particularly in HIV positive or otherwise immunocompromised patients;
4. As a problem-solving tool in complex cases of autoimmune disease;
5. Spinal infections;
6. Possible infection of central or peripheral vascular graft;
7. Suspected implantable cardiac device-related infection in selected cases after sufficient time has elapsed since surgery;
8. Post-fracture osteomyelitis; or
9. To establish the diagnosis and prognosis of idiopathic retroperitoneal fibrosis.

D. Cardiology Indication

1. Assessment of myocardial perfusion (Rb-PET)

a. Stress PET to assess CAD with an intermediate (10-90%) pretest likelihood of significant ischemia secondary to coronary stenosis where there is**:**
   1) Diagnosis of CAD where the need for intervention is uncertain; or
   2) Functional imaging is required, and a low radiation dose is preferable (such as younger patients), or
   3) A high degree of functional accuracy or quantitative flow measurements is required; or
   4) The results of prior non-invasive imaging are equivocal or inconclusive; or
   5) There is a high likelihood of attenuation artifact with SPECT imaging

b. Quantitative PET flow imaging may be useful when there is a need for absolute myocardial blood flow measurements, such as any of the following:
   1) To identify patients who is highly suspected to have multivessel CAD; or
   2) Patients with presenting symptoms and suspected to have ischemia but without known CAD; or
   3) Patients with known CAD where specific physiological assessment is desired; or
   4) To assess possible microvascular dysfunction; or
   5) When there is a question of vasculopathy for heart transplant patients

2. Assessment of myocardial hibernation and viability

- When being considered for cardiac revascularization, cardiac transplantation, or other cardiac procedures with either:
  - Moderate to severe ischemic left ventricular dysfunction (left ventricular ejection fraction of 40% or less) despite maximal therapy; or
  - Moderate to severe persistent perfusion abnormality without significant (moderate or severe) ischemia.

- In combination with perfusion imaging with sestamibi/tetrofosmin or ammonia/rubidium, FDG PET-CT is indicated in ischemic heart failure and poor left ventricular function in preparation with glucose loading and short-acting insulin titrated according to blood glucose level enhances FDG delivery to the chronically ischemic myocardium.

a. Cardiac inflammation

When myocardial inflammation or infection is suspected, FDG PET-CT can provide critical information not evident on other non-invasive imaging techniques provided

b. Sarcoidosis diagnosis

FDG PET-CT is useful in the diagnostic process of sarcoidosis, particularly when findings on conventional tests are inconclusive.

i. To screen for cardiac involvement in biopsy proven or clinical diagnosis of pulmonary or systemic sarcoidosis when obstructive coronary artery disease has been ruled out.

ii. To screen for cardiac sarcoidosis as underlying etiology for patients with age ≤70 years with unexplained significant conduction system disease (defined as high grade Mobitz II 2nd degree or 3rd degree AV block).

iii. FDG PET-CT in combination with resting perfusion imaging, help with tissue diagnosis and assess perfusion metabolism mismatch (of prognostic importance in cardiac sarcoidosis) and reveal treatable active disease in heart, lungs and other extra-cardiac sites such as lymph nodes.

c. Response to treatment

To assess response to treatment for patients with proven cardiac sarcoidosis (with a positive baseline FDG PET scan) when considering a change in treatment, or to assess disease' relapse.

d. Myocarditis

For assessment of suspected myocarditis particularly in difficult cases where other modalities such as cardiac MRI are uncertain and where diagnosis is likely to impact patient management (such as viral or drug induced myocarditis) such as any of the following:

1) Recurrent myocarditis/symptoms or lack of LV function recovery despite adequate treatment of the initial episode; or
2) Persistent elevated troponin levels; or
3) Presenting signs and symptoms of myocarditis including chest pain or shortness of breath, post mRNA vaccine where knowledge of extent of inflammation would change management

3. Cardiomyopathy and arrhythmia

a. For ventricular arrhythmia in unexplained cardiomyopathy, despite adequate investigation, including referral/consultation with an EP (electrophysiology) specialist; or

b. For diagnosis and clinical management of unexplained cardiomyopathy and associated ventricular tachycardia or fibrillation

4. Cardiac Infection

a. Infective endocarditis/graft infection aortic or iliac grafts

As adjunctive diagnostic tool in the evaluation of diagnostically challenging cases of infective endocarditis, particularly in prosthetic valve endocarditis including potential detection of clinically relevant extra-cardiac foci of infection, malignancy and other sources of inflammation such as:

1) Definite infective endocarditis or graft infection with:
   a) Suspicion of extra-cardiac complications (i.e. septic emboli)
   b) Suspicion of cardiac complications (e.g. perivalvular abscess);
2) Rejected infective endocarditis (according to modified Duke Criteria), but clinical suspicion is high;
3) High clinical suspicion for infected graft (including positive blood culture)

b. Infection of cardiac implantable device

FDG PET-CT is useful for the diagnosis and clinical management of patients with high clinical suspicion and/or laboratory evidence of infection of left ventricular assist devices, pacemaker, defibrillator and its' components and/or suspected extra-cardiac complications.

c. Other Cardiovascular Infection or Inflammatory Processes

For the evaluation of patients with suspected cardiovascular infection/inflammatory processes (such as assessment of cardiac masses, rheumatologic disorders or systemic multiple differential inflammatory diagnoses) based on MRI/CT imaging.

E. Neurological indications

1. Neurodegenerative Disorders including Dementia

a. To assess progressive cognitive decline where Alzheimer's dementia (AD) or frontotemporal dementia (FTD) are possible diagnosis if structural imaging (such as MRI, CT) is inconclusive and strong clinical suspicion for dementia particularly in cases of early symptom onset or atypical presentation.

b. To establish the type and subtype of dementia (e.g., AD versus FTD) based on disease-specific patterns of glucose hypometabolism with the understanding that diagnostic overlap may still persist.

c. To assist in the differentiation of degenerative parkinsonism, particularly if associated with cognitive impairment in combination with dopamine transporter radionuclide imaging methods and/or 123I-metaiodobenzylguanidine (mIBG).
d. To monitor the progression of neurodegenerative diseases in highly selected cases (e.g., borderline abnormal scans), and aide in clinical evaluation and cognitive assessment tools
e. When conventional neuroimaging (ie, MRI, CT) is inconclusive, but the clinical impression of an underlying neurodegenerative disorder warrants further assessment, namely in progressive speech disorders (e.g., primary progressive aphasia), differential diagnosis between depressive pseudo-dementia and neurodegeneration disorders, HIV-associated neurocognitive disorder etc.

2. Paraneoplastic syndromes
For evaluation of patients with suspected paraneoplastic neurologic syndromes with negative conventional imaging, with or without positive onconeural antibodies

3. Encephalitis
To establish diagnosis of autoimmune encephalitis and to differentiate the subtype.

4. Epilepsy
a. Pre-epilepsy surgical assessment of medically intractable epilepsy or drug-resistant focal epilepsy and complex partial seizures
b. Localization of epileptogenic focus (especially when co-registered with MRIa), among pediatric and adult patients

References

1. Centers for Medicare and Medicaid Services. National Coverage Determination (NCD) for Positron Emission Tomography (FDG) for Oncologic Conditions (220.6.17). accessed 03/04/25 https://www.cms.gov/medicare-coverage-database/view/ncd.aspx?ncdid=331
2. Centers for Medicare and Medicaid Services. CMS Coverage Transmittal Number 168. Fluorodeoxyglucose (FDG) Positron Emission Tomography (PET) for Solid Tumors. dated May 28, 2014 https://www.cms.gov/Regulations-and-Guidance/Guidance/Transmittals/Downloads/R168NCD.pdf
3. Centers for Medicare and Medicaid Services. National Coverage Determination (NCD) for Positron Emission Tomography (FDG) for (NaF-18) to Identify Bone Metastasis of Cancer (22.6.19). CMS Coverage Transmittal Number 11158 - Positron Emission Tomography (NaF-18) to Identify Bone Metastasis of Cancer https://www.cms.gov/medicare-coverage-database/view/ncd.aspx?ncdid=336&ncdver=2
4. Barakat, A., Yacoub, B., Homsi, M. E., Saad Aldine, A., El Hajj, A., & Haidar, M. B. (2020). Role of Early PET/CT Imaging with 68Ga-PSMA in Staging and Restaging of Prostate Cancer. *Scientific reports*, *10*(1), 2705. https://doi.org/10.1038/s41598-020-59296-6
5. Pienta, K. J., Gorin, M. A., Rowe, S. P., Carroll, P. R., Pouliot, F., Probst, S., Saperstein, L., Preston, M. A., Alva, A. S., Patnaik, A., Durack, J. C., Stambler, N., Lin, T., Jensen, J., Wong, V., Siegel, B. A., & Morris, M. J. (2021). A Phase 2/3 Prospective Multicenter Study of the Diagnostic Accuracy of Prostate Specific Membrane Antigen PET/CT with ^{18}F-DCFPyL in Prostate Cancer Patients (OSPREY). *The Journal of urology*, *206*(1), 52–61. https://doi.org/10.1097/JU.0000000000001698
6. Oprea-Lager, D. E., Gontier, E., García-Cañamaque, L., Gauthé, M., Olivier, P., Mitjavila, M., Tamayo, P., Robin, P., García Vicente, A. M., Bouyeure, A. C., Bailliez, A., Rodríguez-Fernández, A., Mahmoud, S. B., Vallejo-Casas, J. A., Maksud, P., Merlin, C., Blanc-Durand, P., Drouet, C., Tissot, H., Vierasu, I., … Rousseau, C. (2023). [^{18}F]DCFPyL PET/CT versus [^{18}F]fluoromethylcholine PET/CT in Biochemical Recurrence of Prostate Cancer (PYTHON): a prospective, open label, cross-over, comparative study. *European journal of nuclear medicine and molecular imaging*, *50*(11), 3439–3451. https://doi.org/10.1007/s00259-023-06301-5
7. Zhang, L. L., Li, W. C., Xu, Z., Jiang, N., Zang, S. M., Xu, L. W., Huang, W. B., Wang, F., & Sun, H. B. (2021). ^{68}Ga-PSMA PET/CT targeted biopsy for the diagnosis of clinically significant prostate cancer compared with transrectal ultrasound guided biopsy: a prospective randomized single-centre study. *European journal of nuclear medicine and molecular imaging*, *48*(2), 483–492. https://doi.org/10.1007/s00259-020-04863-2
8. Danielsen, M., Kjaer, A., Wu, M., Martineau, L., Nosrati, M., Leong, S. P., Sagebiel, R. W., Miller, J. R., III, & Kashani-Sabet, M. (2016). Prediction of positron emission tomography/computed tomography (PET/CT) positivity in patients with high-risk primary melanoma. *American journal of nuclear medicine and molecular imaging*, *6*(5), 277–285.
9. Rodriguez Rivera, A. M., Alabbas, H., Ramjaun, A., & Meguerditchian, A. N. (2014). Value of positron

emission tomography scan in stage III cutaneous melanoma: a systematic review and meta-analysis. *Surgical oncology*, *23*(1), 11–16. https://doi.org/10.1016/j.suronc.2014.01.002

10. Wu, X., Senanayake, R., Goodchild, E., Bashari, W. A., Salsbury, J., Cabrera, C. P., Argentesi, G., O'Toole, S. M., Matson, M., Koo, B., Parvanta, L., Hilliard, N., Kosmoliaptsis, V., Marker, A., Berney, D. M., Tan, W., Foo, R., Mein, C. A., Wozniak, E., Savage, E., … Brown, M. J. (2023). [^{11}C]metomidate PET-CT versus adrenal vein sampling for diagnosing surgically curable primary aldosteronism: a prospective, within-patient trial. *Nature medicine*, *29*(1), 190–202. https://doi.org/10.1038/s41591-022-02114-5
11. Gennari, A., Brain, E., De Censi, A., Nanni, O., Wuerstlein, R., Frassoldati, A., Cortes, J., Rossi, V., Palleschi, M., Alberini, J. L., Matteucci, F., Piccardo, A., Sacchetti, G., Ilhan, H., D'Avanzo, F., Ruffilli, B., Nardin, S., Monti, M., Puntoni, M., Fontana, V., … ET-FES Collaborative Group (2024). Early prediction of endocrine responsiveness in ER+/HER2-negative metastatic breast cancer (MBC): pilot study with ^{18}F-fluoroestradiol (^{18}F-FES) CT/PET. *Annals of oncology : official journal of the European Society for Medical Oncology*, *35*(6), 549–558. https://doi.org/10.1016/j.annonc.2024.02.007
12. Samim, A., Blom, T., Poot, A. J., Windhorst, A. D., Fiocco, M., Tolboom, N., Braat, A. J. A. T., Viol, S. L. M., van Rooij, R., van Noesel, M. M., Lam, M. G. E. H., Tytgat, G. A. M., & de Keizer, B. (2023). [^{18}F]mFBG PET-CT for detection and localisation of neuroblastoma: a prospective pilot study. *European journal of nuclear medicine and molecular imaging*, *50*(4), 1146–1157. https://doi.org/10.1007/s00259-022-06063-6
13. Quak, E., Lasne-Cardon, A., Cavarec, M., Lireux, B., Bastit, V., Roudaut, N., Salaun, P. Y., Keromnes, N., Potard, G., Vaduva, P., Esvant, A., Jegoux, F., de Crouy-Chanel, O., Devillers, A., Guery, C., Lasnon, C., Ciappuccini, R., Legrand, B., Estienne, A., Christy, F., … Clarisse, B. (2024). F18-Choline PET/CT or MIBI SPECT/CT in the Surgical Management of Primary Hyperparathyroidism: A Diagnostic Randomized Clinical Trial. *JAMA otolaryngology-- head & neck surgery*, *150*(8), 658–665. https://doi.org/10.1001/jamaoto.2024.1421
14. de Fonseka, D., Arnold, D. T., Smartt, H. J. M., Culliford, L., Stadon, L., Tucker, E., Morley, A., Zahan-Evans, N., Bibby, A. C., Lynch, G., Mishra, E., Khan, S., Haris, M., Steer, H., Lewis, L., Ionescu, A., Harvey, J., Blyth, K., Rahman, N. M., Edey, A. E., … Maskell, N. A. (2024). PET-CT-guided *versus* CT-guided biopsy in suspected malignant pleural thickening: a randomised trial. *The European respiratory journal*, *63*(2), 2301295. https://doi.org/10.1183/13993003.01295-2023
15. Brose, A., Michalski, K., Ruf, J., Tosch, M., Eschmann, S. M., Schreckenberger, M., König, J., Nestle, U., & Miederer, M. (2023). PET/CT reading for relapse in non-small cell lung cancer after chemoradiotherapy in the PET-Plan trial cohort. *Cancer imaging : the official publication of the International Cancer Imaging Society*, *23*(1), 45. https://doi.org/10.1186/s40644-023-00567-6
16. Mona, C. E., Benz, M. R., Hikmat, F., Grogan, T. R., Lueckerath, K., Razmaria, A., Riahi, R., Slavik, R., Girgis, M. D., Carlucci, G., Kelly, K. A., French, S. W., Czernin, J., Dawson, D. W., & Calais, J. (2022). Correlation of ^{68}Ga-FAPi-46 PET Biodistribution with FAP Expression by Immunohistochemistry in Patients with Solid Cancers: Interim Analysis of a Prospective Translational Exploratory Study. *Journal of nuclear medicine : official publication, Society of Nuclear Medicine*, *63*(7), 1021–1026.

https://doi.org/10.2967/jnumed.121.262426
17. Wegen, S., van Heek, L., Linde, P., Claus, K., Akuamoa-Boateng, D., Baues, C., Sharma, S. J., Schomäcker, K., Fischer, T., Roth, K. S., Klußmann, J. P., Marnitz, S., Drzezga, A., & Kobe, C. (2022). Head-to-Head Comparison of [^{68} Ga]Ga-FAPI-46-PET/CT and [^{18}F]F-FDG-PET/CT for Radiotherapy Planning in Head and Neck Cancer. *Molecular imaging and biology*, *24*(6), 986–994. https://doi.org/10.1007/s11307-022-01749-7
18. de Koster, E. J., de Geus-Oei, L. F., Brouwers, A. H., van Dam, E. W. C. M., Dijkhorst-Oei, L. T., van Engen-van Grunsven, A. C. H., van den Hout, W. B., Klooker, T. K., Netea-Maier, R. T., Snel, M., Oyen, W. J. G., Vriens, D., & EfFECTS trial study group (2022). [^{18}F]FDG-PET/CT to prevent futile surgery in indeterminate thyroid nodules: a blinded, randomised controlled multicentre trial. *European journal of nuclear medicine and molecular imaging*, *49*(6), 1970–1984. https://doi.org/10.1007/s00259-021-05627-2
19. Chen, T. M., Chen, W. M., Chen, M., Shia, B. C., & Wu, S. Y. (2023). Pre-CCRT 18-fluorodeoxyglucose PET-CT improves survival in patients with advanced stages p16-negative oropharyngeal squamous cell carcinoma via accurate radiation treatment planning. *Journal of otolaryngology - head & neck surgery = Le Journal d'oto-rhino-laryngologie et de chirurgie cervico-faciale*, *52*(1), 14. https://doi.org/10.1186/s40463-023-00623-y
20. Shuch, B., Pantuck, A. J., Bernhard, J. C., Morris, M. A., Master, V., Scott, A. M., van Praet, C., Bailly, C., Önal, B., Aksoy, T., Merkx, R., Schuster, D. M., Lee, S. T., Pandit-Taskar, N., Fan, A. C., Allman, P., Schmidt, K., Tauchmanova, L., Wheatcroft, M., Behrenbruch, C., … Mulders, P. (2024). [^{89}Zr]Zr-girentuximab for PET-CT imaging of clear-cell renal cell carcinoma: a prospective, open-label, multicentre, phase 3 trial. *The Lancet. Oncology*, *25*(10), 1277–1287. https://doi.org/10.1016/S1470-2045(24)00402-9
21. MCG 29th edition. Copyright 2025. Myocardial Positron EmissionTomography (PET) and PET-CT. ACG: A-0097 (AC). Accessed 04/07/2025
22. Martinez Martinez, A., Lecuru, F., Bizzarri, N., Chargari, C., Ducassou, A., Fagotti, A., Fanfani, F., Scambia, G., Cibula, D., Díaz-Feijoo, B., Gil Moreno, A., Angeles, M. A., Muallem, M. Z., Kohler, C., Luyckx, M., Kridelka, F., Rychlik, A., Gerestein, K. G., Heinzelmann, V., Ramirez, P. T., … PAROLA Study group (2023). PARa-aOrtic LymphAdenectomy in locally advanced cervical cancer (PAROLA trial): a GINECO, ENGOT, and GCIG study. International journal of gynecological cancer : official journal of the International Gynecological Cancer Society, 33(2), 293–298 https://doi.org/10.1136/ijgc-2022-004223

KAISER PERMANENTE® Mid-Atlantic States	**Positron Emission Tomography Computed Tomography (PET- CT) Non-Oncology Use** **Medical Coverage Policy**

Approval History

Effective June 01, 2016, state filing is no longer required per Maryland House Bill HB 798 – Health Insurance – Reporting

Date approved by RUMC	Date of Implementation
06/18/2025	06/18/2025

*The Regional Utilization Management Committee received delegated authority in 2011 to review and approve designated Utilization Management and Medical Coverage Policies by the Regional Quality Improvement Committee.

Note: Kaiser Permanente Mid-Atlantic States (KPMAS) include referral and authorization criteria to support primary care and specialty care practitioners, as appropriate, in caring for members with selected conditions. Medical Coverage Policies are not intended or designed as a substitute for the reasonable exercise of independent clinical judgment by a practitioner in any particular set of circumstances for an individual member.