Subject: PET Scan With or Without CT Attenuation (78811, 78812, 78813, 78814, 78815, 78816)		Original Effective Date: 12/13/17
Policy Number: MCR: 656	**Revision Date(s): 12/17/18**	
Review Date: 12/13/17, 12/19/18		

DISCLAIMER

This Molina Clinical Review (MCR) is intended to facilitate the Utilization Management process. It expresses Molina's determination as to whether certain services or supplies are medically necessary, experimental, investigational, or cosmetic for purposes of determining appropriateness of payment. The conclusion that a particular service or supply is medically necessary does not constitute a representation or warranty that this service or supply is covered (i.e., will be paid for by Molina) for a particular member. The member's benefit plan determines coverage. Each benefit plan defines which services are covered, which are excluded, and which are subject to dollar caps or other limits. Members and their providers will need to consult the member's benefit plan to determine if there are any exclusion(s) or other benefit limitations applicable to this service or supply. If there is a discrepancy between this policy and a member's plan of benefits, the benefits plan will govern. In addition, coverage may be mandated by applicable legal requirements of a State, the Federal government or CMS for Medicare and Medicaid members. CMS's Coverage Database can be found on the CMS website. The coverage directive(s) and criteria from an existing National Coverage Determination (NCD) or Local Coverage Determination (LCD) will supersede the contents of this Molina Clinical Review (MCR) document and provide the directive for all Medicare members.

DESCRIPTION OF PROCEDURE/SERVICE/PHARMACEUTICAL

PET scans are based on the principal of nuclear technology. The majority of PET scans are performed using the radiotracer FDG (Flourine-18-deoxyglucose) which is a lab created molecule similar to glucose. The PET scanner is comprised of cylindrical "detectors" which detect gamma rays being emitted from the radioisotope. Computers interpret this data and transform it into an image.

Attenuation is a term used to describe the loss of detectable photons. The reasons for increased or decreased detection of the photons are extremely complicated but can be due to many factors such as different tissue densities, body surface, and body habitus. To address the issue of attenuation, CT is routinely performed to produce a map of different tissue densities within the body which can then be used to correct for differences in photon absorption. All PET scans employ some type of attenuation correction. Today's scanners predominantly use CT.

Glucose is utilized for cellular metabolism. Using a radiolabeled glucose molecule (FDG), cells with higher metabolism will have increased uptake of the FDG molecule compared to surrounding tissue. Many tumor cells have increased metabolism and therefor show increased FDG uptake. Other processes with increased rates of metabolism such as infection, inflammation, and sites of active tissue repair (surgical or traumatic wounds, fractures, chemotherapy) will also have higher uptake of FDG. Conversely, all cancers are not rapidly growing and in addition some types of tumors do not have high concentrations of the transport molecule needed for uptake of FDG so these would show low FDG avidity on PET.

Some tissues have a higher physiologic metabolism when compared to others. Increased FDG uptake is normally seen in brain tissue, laryngeal muscles, salivary glands, thymic tissue, breast, heart, liver, uterus, testes, brown fat cells, and bone marrow. Colonic activity is known to be extremely variable in location and intensity and can make interpretation difficult. Uptake can be falsely low in small lesions,

generally less than 1cm. Finally, FDG is excreted from the body in the urine. This means there is expected increased uptake in the renal collecting system and bladder which makes detecting local tumors or tumors in close proximity to this system extremely difficult.

RECOMMENDATIONS

The following indications are for Flourodeoxyglucose F-18 or FDG radioisotope as it is commonly referred.

PET imaging using isotopes other than FDG-18 (e.g. F18 NaF, 11C-Choline) is considered investigational.

PET imaging concomitantly with diagnostic CT scans is considered not medically necessary. This refers to the performance of both a PET scan with or without CT attenuation correction and, in addition, diagnostic CT scans.

Diagnosis/Initial Staging (For solid tumors, a tissue diagnosis is generally made prior to performance of PET)

- For diagnosis of highly suspicious or initial staging of solid tumors as per chart below
- For a solitary lung nodule or dominant lung nodule greater than 8mm in size seen on CT imaging

Restaging (restaging is to assess response to treatment or when there is a plan to change treatment based on the results)

- As per chart below

Surveillance (surveillance is defined as scanning after finishing treatment and restaging without signs or symptoms of disease recurrence or progression)

- PET scanning is not indicated for an asymptomatic patient who has completed treatment to monitor for a recurrence.

Other

- ALL, AML, and CLL. PET can be appropriate in select indications if there is there is concern for lymphomatous transformation.
- Cardiac Sarcoidosis suspected after MRI completed, or when MRI cannot be completed
- Pulmonary or Systemic Sarcoidosis and Pet is needed to determine treatment

Exclusions

- See chart below
- Diagnosis, initial staging, or restaging of skin cancers other than melanoma
- Non-oncological indications such as infection or inflammation (osteomyelitis, infection, fever of unknown origin)

Tumor	Diagnosis /Initial staging	Restaging	Comments
Anal	Yes*	Yes*	
Bladder	Non-covered	Non-covered	
Bone	Yes*	Yes*	

Tumor	Diagnosis /Initial staging	Restaging	Comments
Breast	Yes[1]	Yes	[1] PET is not covered for initial staging in stage I, II, or operable stage III disease without evaluation of regional lymph nodes.
Central Nervous System	Yes	Yes	
Cervical	Yes	Yes	
Colon	Yes	Yes	
Rectal	Yes	Yes*	
Esophageal	Yes	Yes	
Gastric	Yes*	Yes*	
Head/Neck	Yes	Yes	
Hepatocellular	Non-covered	Non-covered	
Gallbladder	Yes	Yes*	
Lymphoma including Castleman's disease	Yes	Yes	
Kidney	Non-covered	Non-covered	
Mesothelioma	Yes	Yes	
Melanoma	Yes[2]	Yes	[2] PET is not covered for evaluation of regional lymph nodes in the initial staging of melanoma. Sentinel node biopsy should be performed.
Merkel Cell	Yes*	Yes*	
Multiple Myeloma	Yes	Yes	
Neuroendocrine	Yes[3]	Yes[3]	[3] Imaging with Somatostatin receptor based scans (e.g. Octreotide, MIBG) are recommended prior to PET. (These fall under the cpt family 78800 codes.)
Non-small cell lung cancer	Yes	Yes	
Ovarian	Yes	Yes*	
Pancreas	Yes*	Yes*	
Prostate	Non-covered	Non-covered	

Tumor	Diagnosis /Initial staging	Restaging	Comments
Small cell lung cancer	Yes[4]	Non-covered	[4] PET is appropriate only if conventional imaging does not show metastatic disease. E.g. PET is only used to confirm that disease is limited to the chest.
Soft tissue sarcomas including GIST tumors	Yes*	Yes*	
Testicular	Non-covered	Non-covered[5]	[5] PET is covered for restaging of a seminomatous malignancy with residual tumor > 3cm
Thyroid	Non-covered	Yes[6]	[6] PET is covered for patients with papillary, follicular, or Hurthle cell cancer with thyroglobulin levels greater than 10ng/ml and inconclusive imaging. PET is covered for medullary thyroid cancer with elevated calcitonin levels and inconclusive imaging.
Unknown primary	Yes*	Yes*	
Uterine	Yes*	Yes*	
Vulvar	Yes	Yes	

Only if initial evaluation with CT, MRI, or other imaging is indeterminate

ADDITIONAL CRITICAL INFORMATION

The following medical necessity criteria are used to determine the best diagnostic study based on a patient's specific clinical circumstances. The criteria were developed using evidence based recommendations and current accepted clinical practices. Medical necessity will be determined using a combination of established criteria as well as the patient's individual clinical or social circumstances present at the time of the request.

Due to variability in imaging protocols, scans should be completed at the same imaging facility to enable accurate comparison to prior scans. Allowance should be made for appropriate time intervals after treatment as certain chemotherapeutic agents, radiation treatments, and surgical procedures can lead to false positive scans if performed too soon after treatment.

REFERENCES USED FOR DETERMINATIONS

1. Vita T, Okada DR, Veillet-Chowdhury M, et al. Complementary Value of Cardiac Magnetic Resonance Imaging and Positron Emission Tomography/Computed Tomography in the Assessment of Cardiac Sarcoidosis. Circ Cardiovasc Imaging 2018; 11:e007030.
2. Harvey JA, Bassewtt LW, Evans WP III et al, Expert panel on Breast Imaging, American College of Radiology Appropriateness Criteria- Stage I breast carcinoma, accessed at http://www.acr.org/SecondaryMainMenuCategories/quality_safety/app_criteria/pdf/ExpertPanelonWomensImagingBreastWorkGroup/StageIBreastCarcinomaDoc4.aspx , August 1, 2011.
3. Perros P, Clarke SEM, Franklyn J, Thyroid cancer guidelines update group, Guidelines for the management of thyroid cancer, second edition, British Thyroid Association Royal College of

Physicians, 2007, accessed at http://www.britishthyroid-association.org/Thyroid_cancer_guidelines_2007.pdf December 10, 2007.
4. Bredella MA, Stenbachj L, Caputo G, et al, Value of FEG PET in the assessment of patients with multiple myeloma, AJR, 2005: 184:1199-1204.
5. Bastinaannet E, Groen H, Jager PL, et al, The value of FDG-PET in the detection, grading and response to therapy of soft tissue and bone sarcomas; a systematic review and meta-analysis, Cancer treatment Reviews, 2004; 30:83-101.
6. Follen M, Levenback CF, Iiyer RB, et al, Imaging in cervical cancer, Cancer, 2003; 98(9 Suppl):2028-2038.
7. Schaefer NG, Hany TF, Taverna C, et al, Non-Hodgkin lymphoma and Hodgkin disease: co registered FDG PET and CT at staging and restaging-do we need contrast-enhanced CT, Radiology, 2004; 232:823-829.
8. Kinkel D, Lu Y, Both M, et al, Detection of hepatic metastases from cancers of the gastrointestinal tract by using noninvasive imaging methods (US, CT, MR imaging, PET): a meta-analysis, Radiology, 2002; 224:748-756.
9. Silvestri GA, Gould MK, Margolis ML, et al, Noninvasive staging of non-small cell lung cancer: ACCP evidenced-based clinical practice guidelines (2nd edition), Chest, 2007; 132:178-201.
10. Kahn A, Lee TJ, Mohammed T-L, et al, Expert Panel on Thoracic Imaging, American College of Radiology Appropriateness Criteria: solitary pulmonary nodule, accessed at http://www.acr.org/SecondaryMainMenuCategories/quality_safety/app_criteria/pdf/ExpertPanelonThoracicImaging/solitarypulmonarynoduleDoc10.aspx, August 1, 2011.
11. Pyo, J., Kim, K.W., Jacene, H.A., Sakellis, C.G., Brown, J.R., & Van den Abbeele, A.D. (2013). End-therapy positron emission tomography for treatment response assessment in follicular lymphoma: A systematic review and meta-analysis. Clin Cancer Res.

CODING INFORMATION: THE CODES LISTED IN THIS POLICY ARE FOR REFERENCE PURPOSES ONLY. LISTING OF A SERVICE OR DEVICE CODE IN THIS POLICY DOES NOT IMPLY THAT THE SERVICE DESCRIBED BY THIS CODE IS COVERED OR NON-COVERED. COVERAGE IS DETERMINED BY THE BENEFIT DOCUMENT. THIS LIST OF CODES MAY NOT BE ALL INCLUSIVE.

CPT	Description
78811	PET (Positron Emission Tomography) limited area)
78812	PET (Positron Emission Tomography) Skull base to mid-thigh)
78813	PET (Positron Emission Tomography) whole body)
78814	PET (Positron Emission Tomography) with CT (Computed Tomography) attenuation, limited area)
78815	PET (Positron Emission Tomography) with CT (Computed Tomography) attenuation, skull base to mid-thigh)
78816	PET (Positron Emission Tomography) with CT (Computed Tomography) attenuation, whole body)