Subject: Brain PET, (78608)		Original Effective Date: 12/13/17
Policy Number: MCR: 655	**Revision Date(s):**	
Review Date: 12/13/17		

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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 Brain PET scans are considered Metabolic PET, performed using the radiotracer FDG (Flourine-18-deoxyglucose) which is a lab created molecule similar to glucose. A less common type of Brain PET scan is Amyloid PET which uses a radiotracer that binds to amyloid deposits in the brain, and is sometimes requested in the evaluation of dementia. 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

Brain Tumor

- Inconclusive imaging findings and PET will be used to clarify the need for biopsy or change in therapy
- Post treatment evaluation to determine residual tumor versus radiation necrosis

Seizure

- Pre-surgical evaluation for refractory seizures

Dementia/Cognitive Decline

- Pet imaging (Metabolic PET and Amyloid PET) is considered investigational for the evaluation of dementia.

All other indications for Brain PET are non-covered.

ADDITIONAL INFORMATION

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

- Tests that will not change treatment plans should not be recommended.
- Same or similar tests recently completed need a specific reason for repeat imaging.

REFERENCES USED FOR DETERMINATIONS

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CPT	Description
78608	Brain PET