

# 2025 Positron Emission Tomography (PET) Brain

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## *Diagnostic Imaging*

PET-Brain-HH  
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## Positron Emission Tomography (PET) Brain

### PET Brain Related National Coverage Determination (NCD)/ Local Coverage Determination (LCD)

Please refer to <https://www.cms.gov/medicare-coverage-database/search.aspx> if applicable to the individual's health plan membership.

Type/ID Number	Title
NCD 220.6.13	FDG PET for Dementia and Neurodegenerative Diseases
NCD 220.6.17	PET (FDG) for Oncologic Conditions
NCD 220.6.9	FDG PET for Refractory Seizures
LCD 39521	Positron Emission Tomography (PET) Scan for Inflammation and Infection
LCD 35391	Multiple Imaging in Oncology

### Clinical Judgment

These medical policies are designed to provide clinical guidance and do not supplant a provider's independent professional judgment. Physicians retain full and independent authority to determine appropriate care based on each patient's individual clinical circumstances. Although services may be subject to documentation requirements, medical necessity review, or coverage limitations, nothing in this policy is intended to restrict or interfere with a physician's independent medical judgment.

### Preamble: Pediatric Diagnostic Imaging

HealthHelp's clinical guidelines for the Diagnostic Imaging program, are intended to apply to both adults and pediatrics (21 years of age or younger), unless otherwise specified within the criteria.



#### WARNING

**Oncological PET** is indicated for biopsy-proven known cancer or if cancer is highly suspected based on other diagnostic testing. The appropriateness of an ordered PET/computed tomography (CT) *depends on the radiopharmaceutical* to be used.

### PET Brain Guideline

Positron emission tomography (PET) of the brain is considered medically appropriate when the documentation demonstrates **ANY** of the following:

(\***NOTE:** *Computed tomography (CT) of the brain is acceptable if magnetic resonance imaging (MRI) of the brain is **contraindicated**. CT of the brain is **NOT** a substitute for MRI when PET request is to evaluate amyloid plaque before, during and after certain Alzheimer's medications (eg, Adulhelm, Lequmbi).*)

1. Cancer or brain tumor is known, brain MRI is non-diagnostic or indeterminate and **ANY** of the following:
  - a. High-grade glioma differentiation
  - b. Lymphoma of the brain, primary, for evaluation
  - c. Meningioma evaluation
  - d. Procedural guidance (eg, biopsy, intervention)
  - e. Radiation necrosis differentiation from residual/recurrent tumor after treatment

**References:** [3] [7]

2. Cognitive impairment or dementia is known and **ALL** the following:
  - a. **ANY** of the following:
    - i. Alzheimer's disease, dementia with Lewy body disease (DLB) and frontotemporal lobar degeneration (FTD), for condition differentiation
    - ii. Beta amyloid plaque presence (in Alzheimer's disease) is suspected and study is needed to be considered for treatment with Aduhelm or Lequmbi
    - iii. Early Alzheimer's disease detection
  - b. Brain MRI is non-diagnostic or indeterminate and **ALL** of the following:
    - i. Mini mental status evaluation (MMSE) or Montreal cognitive assessment (MoCA) with results less than 26 **OR** neuropsychological test (eg, memory testing, mood and personality, motor speed and dexterity) showing **AT LEAST** mild cognitive impairment
    - ii. Potential treatable causes (eg, anemia, medication side effects, inflammatory disease, vascular disease) are assessed and treated as appropriate.

**References:** [3] [6] [2] [1] [5]

3. Parkinson's disease and atypical parkinsonian syndromes (eg, multiple system atrophy, progressive supranuclear palsy, corticobasal syndrome), for condition differentiation

**References:** [3]

4. Seizure is refractory, to determine candidacy for intervention.

**References:** [3] [4]

## PET Brain Summary of Changes

PET brain had the following version changes from 2024 to 2025:

**Table 1. PET Brain Summary of Changes**

Date	Type of Change	Summary
09/09/2025	Annual	<ul style="list-style-type: none"> <li>Added "Parkinson's disease and atypical parkinsonian syndromes (eg, multiple system atrophy, progressive supranuclear palsy, corticobasal syndrome), for condition differentiation." per the evidence</li> <li>Citations updated per the evidence.</li> <li>Removed the following as current evidence no longer supports the indication:               <ul style="list-style-type: none"> <li>NOTE from "Beta amyloid plaque presence" as it is not accurate.</li> <li>"Post treatment/procedural evaluation of progress after intervention, procedure, surgery or treatment."</li> <li>"Prior PET brain imaging is non-diagnostic or indeterminate." as it was too broad</li> </ul> </li> </ul>

## PET Brain Procedure Codes

**Table 1. Brain Positron Emission Tomography (PET) Associated Procedure Codes**

CODE	DESCRIPTION
78608	Brain imaging, positron emission tomography (PET); metabolic evaluation
78609	Brain imaging, positron emission tomography (PET); perfusion evaluation
78811	Positron emission tomography (PET) imaging; limited area (eg, chest, head/neck)
78812	Positron emission tomography (PET) imaging; skull base to mid-thigh
78813	Positron emission tomography (PET) imaging; whole body
78814	Positron emission tomography (PET) with concurrently acquired computed tomography (CT) for attenuation correction and anatomical localization imaging; limited area (eg, chest, head/neck)
78815	Positron emission tomography (PET) with concurrently acquired computed tomography (CT) for attenuation correction and anatomical localization imaging; skull base to mid-thigh
78816	Positron emission tomography (PET) with concurrently acquired computed tomography (CT) for attenuation correction and anatomical localization imaging; whole body

## PET CNS Definitions

**Alzheimer's disease** is a degenerative brain disease of unknown cause that is the most common form of dementia. It usually starts in late middle age or in old age and results in progressive memory loss, impaired thinking, disorientation and changes in personality and mood.

**Beta-amyloid plaque** extracellular deposits of amyloid-beta ( $A\beta$ ) protein fragments, primarily  $A\beta$  1-40 and  $A\beta$  1-42, which accumulate in the brain and are a hallmark of Alzheimer's disease.

**Carcinoma** a cancer that begins in the skin or in tissues that line or cover internal organs.

**Cognitive impairment** refers to difficulty remembering, learning new things, concentrating or making decisions that affect their everyday life.

**Computed tomography (CT)** is an imaging test that uses X-rays to computer analysis to generate cross sectional images of the internal structures of the body that can be displayed in multiple planes.

**Dementia** is a usually progressive condition marked by the development of multiple cognitive deficits, such as memory impairment, aphasia and the inability to plan and initiate complex behavior.

**Diffuse Lewy body disease** is a neurodegenerative disorder characterized by dementia, fluctuations in mental status, hallucinations and parkinsonism.

**Glioma** are primary central nervous system (CNS) tumors that originate from glial cells or neural stem/progenitor cells and are classified into various types and grades based on histological and molecular characteristics.

**High-grade glioma** a malignant brain tumor classified by the World Health Organization (WHO) as grade III (anaplastic astrocytoma) or grade IV (glioblastoma) based on histopathologic analysis.

**Indeterminate** findings are inconclusive or insufficient for treatment planning.

**Initial staging** refers to imaging that is performed **AFTER** the diagnosis of cancer is made, and generally before any treatment.

**Lewy body dementia (LBD)** is a disease associated with abnormal deposits of a protein called alpha-synuclein in the brain. These deposits, called Lewy bodies, affect chemicals in the brain whose changes, in turn, can lead to problems with thinking, movement, behavior and mood.

**Lymphoma** is a type of blood cancer that affects the immune system. Lymphoma occurs when abnormal white blood cells, called lymphocytes, grow in the lymphatic system.

**Magnetic resonance imaging (MRI)** is a non-invasive diagnostic technique that produces computerized images of internal body tissues and is based on nuclear magnetic resonance of atoms within the body induced by the application of radio waves.

**Malignant Peripheral Nerve Sheath Tumor, or MPNST,** is a rare and aggressive type of soft tissue sarcoma that often arises from preexisting benign neurofibromas, particularly in patients with neurofibromatosis type 1 (NF1), and has a poor prognosis.

**Meningioma** is a slow-growing, encapsulated, typically benign tumor arising from the meninges and often causes damage by pressing upon the brain and adjacent parts.

**Mini-Mental State Examination** is a set of 11 questions that doctors and other healthcare professionals commonly use to check for cognitive impairment (problems with thinking, communication, understanding and memory).

**Montreal Cognitive Assessment (MoCA)** is a brief test of cognitive function, taking 10 minutes to administer. It assesses short-term memory, visuospatial function, executive function, attention, concentration and working memory, language and orientation.

**Non-diagnostic** is a result that does not lead to a confirmed diagnosis.

**Paraganglioma** is a type of neuroendocrine tumor that forms near certain blood vessels and nerves outside of the adrenal glands.

**Parkinson's disease** is a chronic progressive neurological disease chiefly of later life that is linked to decreased dopamine production in the substantia nigra and is marked especially by tremor of resting muscles, rigidity, slowness of movement, impaired balance and a shuffling gait.

**Pediatric approximate ages** are defined by the US Department of Health (USDH), the Food and Drug Administration (FDA), and the American Academy of Pediatrics (AAP) as the following:

1. Infancy, between birth and 2 years of age
2. Childhood, from 2 to 12 years of age
3. Adolescence, from 12 to 21 years of age, further defined by the AAP into:
  - a. Early (ages 11–14 years)
  - b. Middle (ages 15–17 years),
  - c. Late (ages 18–21 years)
  - d. Older ages may be appropriate for children with special healthcare needs.

**Positron emission tomography (PET) scan** is a procedure in which a small amount of radioactive glucose (sugar) is injected into a vein, and a scanner is used to make detailed, computerized pictures of areas inside the body where the glucose is taken up. It is a medical imaging test that shows the metabolic or biochemical function of organs and tissues.

**Primary central nervous system (CNS) lymphoma** is a disease in which malignant (cancer) cells arising from lymphocytes (white blood cells) form tumors in the brain or spinal cord. The tumor causes pressure on the surrounding brain structures and can cause significant neurological symptoms.

**Radiation necrosis** refers to the death of healthy tissue caused by radiation therapy, occurring as a complication of radiotherapy or radiosurgery, where the tissue at the original tumor site or within the irradiated area undergoes cell death due to damage from radiation, often developing months to years after treatment is completed; it is considered a severe side effect of radiation therapy.

**Restaging** includes scans that are either needed during active treatment (subsequent treatment strategy) to determine response to treatment, within 6 months after the end of treatment, or when there is clinical concern for recurrence (eg, new imaging, new signs, rising labs/tumor markers or symptoms relative to type of cancer and entire clinical picture). Recurrence is not required to be biopsy proven.



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**Staging** in cancer is the process of determining how much cancer is within the body (tumor size) and if it has metastasized (spread).

## PET Brain References

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- [5] (2023). LEQEMBI® (lecanemab-irmb) injection package insert. *U.S. Food and Drug Administration (FDA)*. Retrieved: January 2025. <https://www.accessdata.fda.gov/scripts/cder/daf/index.cfm?event=overview.process&ApplNo=761269>
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## Disclaimer section

### Purpose

The purpose of the HealthHelp's clinical guidelines is to assist healthcare professionals in selecting the medical service that may be appropriate and supported by evidence to safely improve outcomes. Medical information is constantly evolving, and HealthHelp reserves the right to review and update these clinical guidelines periodically. HealthHelp reserves the right to include in these guidelines the clinical indications as appropriate for the organization's program objectives. Therefore the guidelines are not a list of all the clinical indications for a stated procedure, and associated Procedure Code Tables may not represent all codes available for that state procedure or that are managed by a specific client-organization.

## Clinician Review

These clinical guidelines neither preempt clinical judgment of trained professionals nor advise anyone on how to practice medicine. Healthcare professionals using these clinical guidelines are responsible for all clinical decisions based on their assessment. All Clinical Reviewers are instructed to apply clinical indications based on individual patient assessment and documentation, within the scope of their clinical license.

## Payment

The use of these clinical guidelines does not provide authorization, certification, explanation of benefits, or guarantee of payment; nor do the guidelines substitute for, or constitute, medical advice. Federal and State law, as well as member benefit contract language (including definitions and specific contract provisions/exclusions) take precedence over clinical guidelines and must be considered first when determining eligibility for coverage. All final determinations on coverage and payment are the responsibility of the health plan. Nothing contained within this document can be interpreted to mean otherwise.

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## National and Local Coverage Determination (NCD and LCD)



### NOTICE

To ensure appropriate review occurs to the most current NCD and/or LCD, always defer to <https://www.cms.gov/medicare-coverage-database/search.aspx>.

## Background

National Coverage Determinations (NCD) and Local Coverage Determinations (LCD) are payment policy documents outlined by the Centers for Medicare and Medicaid Services (CMS) and the government's delegated Medicare Audit Contractors (MACs) that operate regionally in jurisdictions.



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CMS introduced variation between different jurisdictions/Medicare Audit Contractors (MACs) and their associated covered code lists with the transition to ICD 10. The variation resulted in jurisdictions independently defining how codes are applied for exclusions, limitations, groupings, ranges, etc. for the medical necessity indications outlined in the NCD and LCD. Due to this variation, there is an inconsistent use/application of codes and coverage determinations across the United States between the different MACs.

In addition, **WITHOUT** notice, CMS can change the codes that indicate medical necessity and the format of the coverage determinations/associated documents (eg, Articles). This is an additional challenge for organizations to keep up with ongoing, unplanned changes in covered codes and medical necessity indications.

## Medical Necessity Codes

Due to the variation in code application between jurisdictions/MACs and that updates can happen without notification, HealthHelp is not able to guarantee full accuracy of the codes listed for any Coverage Determination, and advises that prior to use, the associated Coverage Determination Articles are reviewed to ensure applicability to HealthHelp's programs and any associated NCDs and LCDs.

### For Internal Use Only:

11248 11249 11253 11282 11325 11328 11333 11349 11350 11351 11352 11354 11355 11356  
11358 11359 11360 11361 11362 11365 11366 11367 11368 11369 11370 11374 11375 11394  
11395 11396 11565