Amyvid PET/CT Scan
Pathophysiology of Alzheimer Disease

- β-Amyloid neuritic plaques (black arrows)
- Neurofibrillary tangles (abnormally phosphorylated tau protein) (red arrow)

**β**-Amyloid Neuritic Plaque: A Defining Neuropathology of Alzheimer’s Disease

- Significant **β**-amyloid plaque accumulation is generally present when symptoms of cognitive impairment due to Alzheimer’s Disease (AD) appear. \(^2,3\)

- The absence or presence of significant amyloid plaques can be used as a reliable biomarker after presentation of the first clinical signs and symptoms of cognitive decline. \(^1,4,5\)

- **β**-amyloid neuritic plaques may also be present in patients with other types of neurologic conditions, as well as older people with normal cognition. *The presence of amyloid plaques alone does not establish a diagnosis of AD or other cognitive disorders.*

More info available at: [http://www.amyvidhcp.com](http://www.amyvidhcp.com)
What is Amyvid?

- Amyvid is florbetapir, a radiopharmaceutical tracer (not FDG) used in adult patients undergoing clinical evaluation for AD and other causes of cognitive decline.
- Like FDG, it is labeled with fluorine-18 (F 18), an isotope that produces positrons detectable by a PET scanner.
- Amyvid is injected into the bloodstream, where it crosses the blood-brain barrier and specifically binds to $\beta$-amyloid neuritic plaques.
- Imaging is performed at 40 minutes after injection.
- Scan takes 10 minutes.
Indications for Amyvid

- Rule out Alzheimer’s Disease
- Determine whether the patient is a candidate for treatment with acetylcholinesterase inhibitors (e.g. Aricept) or NMDA receptor antagonists (e.g. Namenda) because of their side effects
Appropriate Use Criteria for Amyvid PET/CT

- Cognitive complaint with objectively confirmed impairment, and
- AD diagnosis uncertain to dementia expert, and
- Knowledge of $\beta$-Amyloid +/- status will increase diagnostic certainty and alter management

PLUS ONE OF:

- Persistent or progressive unexplained mild cognitive impairment.
- Possible AD: Unclear clinical presentation (atypical clinical course, or etiologically mixed presentation).
- Progressive dementia and $\leq$ 65 years old.
How is Amyvid Used?

• Amyvid™ (Florbetapir F 18 Injection) is used to estimate beta-amyloid neuritic plaque density in adult patients with cognitive impairment who are being evaluated for AD and other causes for cognitive decline.

• Negative scans correlate with CERAD criteria of “None to sparse amyloid plaque levels,” inconsistent with AD.

• Positive scans correlate with CERAD criteria of “Moderate to frequent amyloid plaque levels,” consistent with a neuropathological diagnosis of AD.

• A positive Amyvid scan does not establish a diagnosis of AD, but a negative scan rules it out.
54 year old woman

Normal CT

Normal Amyvid

None to sparse amyloid plaque levels

Typical Negative Scan

quality medical imaging | experienced subspecialty radiologists | state-of-the-art technology
Typical Positive Scan

CT Scan

Positive Amyvid

54 year old man

Moderate to frequent amyloid plaque levels

quality medical imaging | experienced subspecialty radiologists | state-of-the-art technology
Radiology Reporting

- **Negative scans** show more radioactivity in white matter than in gray matter, creating clear gray-white contrast
- **Positive scan** must show one of the following:
  a. 2 or more brain areas (each larger than a single cortical gyrus) in which there is reduced or absent gray-white contrast. *This is the most common appearance of a positive scan (according to Lilly training)*
  - OR -
  b. 1 or more areas in which gray matter radioactivity is intense and clearly exceeds radioactivity in adjacent white matter.

*85% of scans we reviewed were obviously positive or negative.*
Radiology Reporting

Accuracy of scans has been validated in multiple clinical studies with multiple readers and autopsy data.

- 96% sensitivity (95% CI: 80% to 100%) and 100% specificity (95% CI: 78% to 100%) for amyloid plaques; this means objective evidence of amyloid pathology*

- High inter-reader reproducibility (overall Fleiss’ kappa* statistic of 0.83 [95% CI: 0.78 to 0.88] [n=151]; the lower bound of the 95% CI exceeded the pre-specified success criterion)

*In patients with autopsies performed within 1 year of Amyvid scan (n=46). Sensitivity and specificity were calculated using the majority interpretation of the readers for the presence or absence of moderate to frequent amyloid plaques.
Suburban’s Neuroradiologists

Jeff Brace  Eric Bressler  Kevin Gustafson  Ken Korte  Dan Loes
What are side effects of Amyvid?

Most Common Adverse Reactions:
- Headache (1.8%)
- Musculoskeletal pain (0.8%)
- Fatigue (0.6%)
- Nausea (0.7%)

Radiation exposure: 7 milliSieverts (mSv), within the range of other FDA-approved PET tracers (1 to 12 mSv)6-8
Pricing

Amyvid drug cost = $2,808

- **Vouchers** are available to cover this cost
- Each provider is allowed 5 vouchers
- Vouchers expire every 3 months
- Current vouchers expire June 30
Reimbursement

Suburban Imaging Global Fee = $800

- Medicare does not reimburse
- Patient required to sign Advanced Beneficiary Notice (ABN)
- Will submit to insurance and reimburse patient if payment is collected

In comparison, BCBS MRI w/wo contrast = $1,300
How to Order

• Please complete PET/CT Scan Order form and voucher
• Fax form and voucher to Scheduling at 952.837.9774
References


