Mild Cognitive Impairment and Brain Amyloid Imaging

Decision Aid

A tool to help you decide whether to undergo brain amyloid imaging and learn the results

This guide provides information about brain amyloid imaging for people with mild cognitive impairment (MCI). People with MCI may have the opportunity to undergo brain amyloid imaging as part of a clinical evaluation or through research. This guide describes MCI and amyloid imaging, how MCI is related to Alzheimer's disease, and what amyloid imaging can tell us about this relationship.

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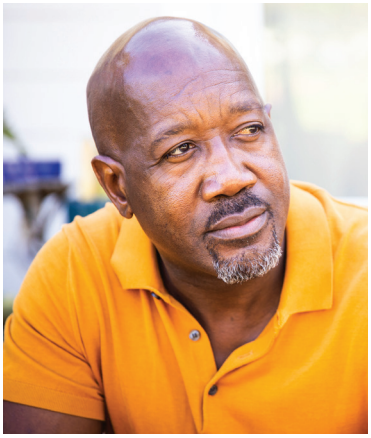
Mild Cognitive Impairment

What is mild cognitive impairment (MCI)?



- MCI is a condition in which a person experiences a noticeable decline in thinking, yet is still able to carry out everyday activities independently.
- MCI is different from normal aging, as people with MCI have lower scores than expected for their age on tests of memory and/or other thinking skills.
- MCI is also different from dementia. Dementia is a decline in thinking that is significant enough to interfere with everyday activities.
- People with MCI are at increased risk, compared to people their age who don't have MCI, to develop dementia in the future.

What types of thinking changes occur with MCI?

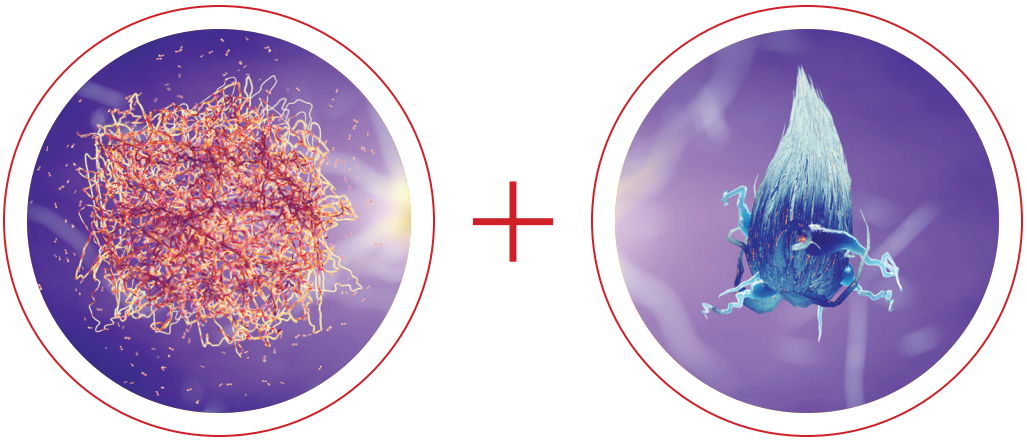
- Thinking changes in MCI can be divided into two types:
  1. Amnestic: memory loss (amnesia), such as forgetting recent events and conversations
  2. Non-amnestic: changes in thinking abilities other than memory, such as having trouble using words, making good decisions, or recognizing things by their appearance
- A person can have amnestic MCI, non-amnestic MCI, or a combination of both.

What causes MCI?

- MCI has many possible causes, just like dementia has many possible causes.
- Sometimes MCI is due to a reversible problem that affects the brain, such as a thyroid imbalance or medication side effect.
- In other cases, MCI is due to an irreversible problem within the brain, such as Alzheimer's disease or damage from strokes.

What is Alzheimer's disease?

- Alzheimer's disease is a brain disease in which there is an abnormal buildup of proteins in the form of:



Plaques:
made up of a protein called *amyloid*

Tangles:
made up of a protein called *tau*

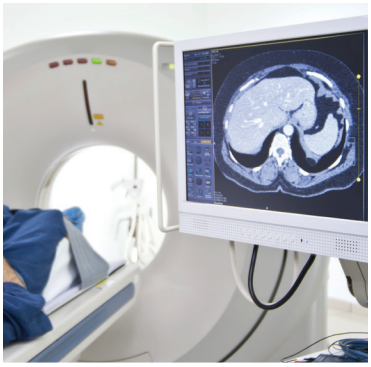
- The plaques and tangles interfere with the function of brain cells involved in thinking abilities.
- The plaques and tangles start to build up many years before symptoms develop, so Alzheimer's disease changes are thought to be initially "silent," but eventually may cause mild symptoms (MCI) and later, more significant problems (dementia).

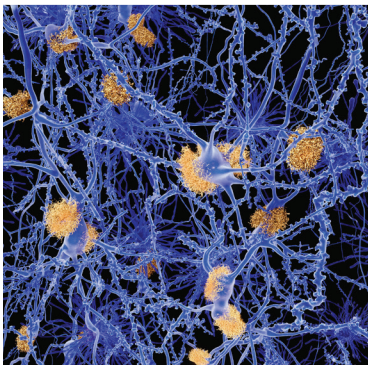
What happens to people with MCI over time?

- Over time, some — but not all — people with MCI get worse and develop dementia. Some people with MCI stay the same — their thinking problems don't get worse or better. And some people with MCI even have their thinking problems improve and get back to normal, depending on what caused the problems.
- There are many factors that influence whether MCI worsens over time, including the type of MCI (amnestic, non-amnestic, or both) and the underlying cause(s). A careful evaluation that includes blood tests and standard brain scans, such as a CT or MRI scan, can help clinicians better assess the underlying cause(s) of MCI.

Brain Amyloid Imaging

What is amyloid imaging?





- Amyloid imaging is a special type of brain scan that detects if there is significant buildup of amyloid protein in the brain.
- Amyloid imaging uses a tracer (like a dye) that briefly sticks to amyloid. The tracer is injected (like a shot) into a vein in the arm. The tracer travels to the brain and sticks to amyloid plaques, if they are present. A special machine called a positron emission tomography, or PET, scanner detects whether the tracer is sticking in the brain. The scanner does this by picking up the small amount of radiation given off by the tracer. By looking at the PET images, doctors with special training can tell if there is significant buildup of amyloid in the brain. A "positive" scan indicates significant amyloid plaque buildup, and a "negative" scan indicates minimal or no amyloid buildup.

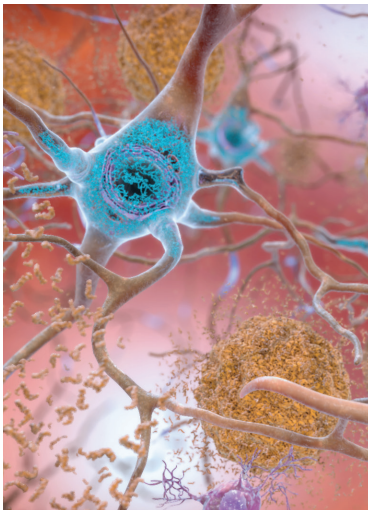
What information does amyloid imaging provide people with MCI?

- An amyloid scan helps doctors understand whether MCI symptoms are likely due to Alzheimer's disease. However, an amyloid scan detects only one of the two key brain changes of Alzheimer's disease. It cannot on its own diagnose Alzheimer's disease.
- If the scan is read as negative, it is very unlikely that a person's MCI is due to Alzheimer's disease. MCI is still a concern, even when not due to Alzheimer's disease. Other causes of MCI should be considered.
- If the scan is read as positive, it is valuable information for the doctor in arriving at a diagnosis because a positive scan suggests that MCI is more likely due to Alzheimer's disease. However, the doctor will base the diagnosis not only on the results of amyloid imaging, but also on information like the patient's other health conditions, symptoms, and results of other diagnostic tests.

What can amyloid imaging tell a person about the prognosis of MCI?

- A person with MCI and a positive amyloid scan has a higher risk of progression to dementia (typically Alzheimer's dementia) over the next several years, compared to someone with a negative scan.
- Other factors also influence this risk. So, it is difficult to give a precise estimate of the risk of progression using amyloid imaging alone.
- There is still some risk of progression to dementia (typically a non-Alzheimer's dementia), even if the amyloid scan is negative.

What can be done if a scan is "positive" (shows significant amyloid buildup)?



- A treatment directed at brain amyloid buildup may be an option. Such treatments are being studied in clinical trials and one has been approved by the Food and Drug Administration. The approved medication is called aducanumab (brand name, Aduhelm). An amyloid scan would help determine if treatment with aducanumab or being in a research study using a similar medication is appropriate.
- Regardless of the results of the amyloid scan, people with MCI can benefit from making healthy lifestyle choices. These include following a healthy diet, getting enough sleep, and participating in regular mental, physical, and social activities.
- People with MCI may use the amyloid scan result as motivation to make or adjust long-term plans such as making financial and legal arrangements (for example, designating powers of attorney), advance directives for medical care, and insurance decisions.

What else is important to know about amyloid imaging and MCI?

- The accuracy of an amyloid scan in detecting significant brain amyloid buildup is very high, but not 100%.
- Participants in studies of MCI and amyloid imaging have been predominantly non-Hispanic white. Researchers feel that amyloid imaging likely provides similar information for people from other racial and ethnic groups, but more studies with diverse participants are needed to confirm this.

Why might someone with MCI **choose** to have amyloid imaging?

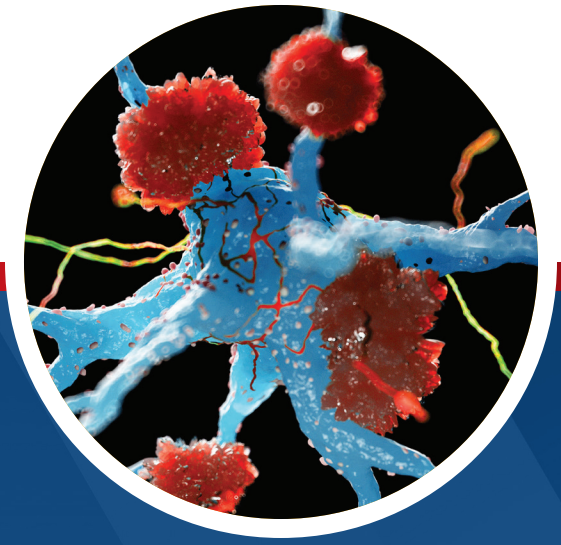
- To learn more about the likelihood that their MCI symptoms are due to Alzheimer's disease.
- To help determine if treatment with aducanumab, a drug that removes brain amyloid, is appropriate.
- To participate in a research study that includes an amyloid scan, such as a study to learn whether reducing brain amyloid is helpful for cognitive health and memory.

Why might someone with MCI **choose not** to have amyloid imaging?

- Some people just don't want to know what an amyloid scan might show.
- There are potential risks of discrimination. For example, someone known to have brain amyloid buildup **may not be eligible for long-term care insurance**.
- For those interested in research studies, having an amyloid scan does not guarantee that they will be able to participate. Due to other health conditions or circumstances, they may not qualify for a study even if their scan shows brain amyloid buildup.

What else should I consider before deciding whether to have amyloid imaging and learn the results?

- Will you incur costs to have an amyloid scan? Research amyloid scans are typically provided at no cost. Clinical amyloid scans are **not** typically covered by insurance. You should discuss this with your provider.
- Will the results help you make future decisions about your health care or lifestyle?
- Will the results cause you undue worry about the future?
- Who would you like to bring to the meeting where the results are discussed?
- With whom would you share the results afterwards?



If you have additional questions about brain amyloid imaging or PET scans, speak with your medical specialist or research team.

If you are interested in participating in a clinical trial or study, visit **www.alzheimers.gov/clinical-trials** for more information.

This information is provided by the Advisory Group on Risk Evidence Education for Dementia (AGREEDementia). Learn more at **www.agreedementia.org**.

AGREEDementia