Decline in daily functioning related to decreased brain activity in Alzheimer's

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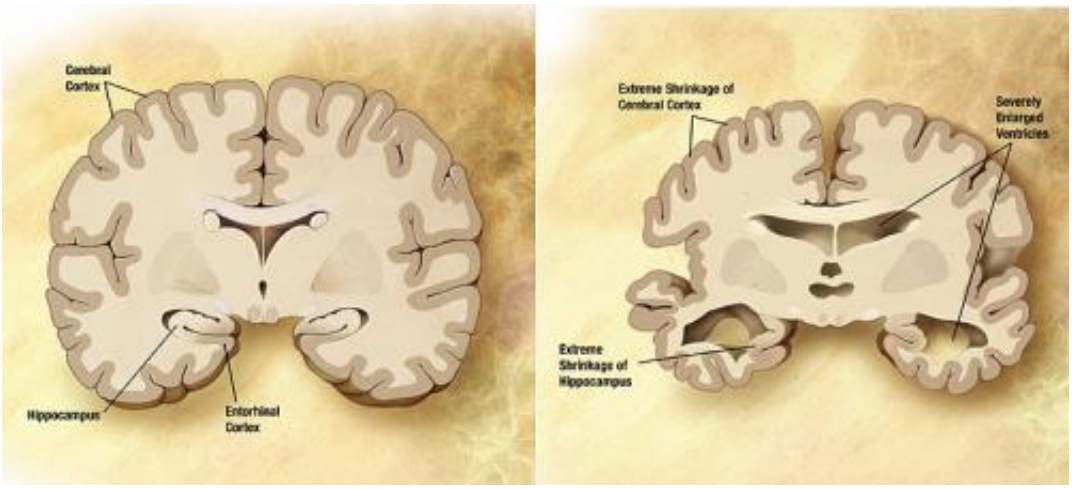

Diagram of the brain of a person with Alzheimer's Disease. Credit: Wikipedia/public domain.

Decline in daily functioning associated with Alzheimer's disease is related to alterations in activity in certain regions of the brain, according to a study published in the August 2014 issue of the *Journal of Alzheimer's Disease*.

Impairment in instrumental activities of daily living—or an inability to perform high-level daily activities such as calculating finances, remembering appointments and medications, and driving—is first seen when a person has mild cognitive impairment, which can later progress to dementia due to Alzheimer's disease. Deterioration in the ability to

carry out daily activities has been associated with changes in brain activity measured as use of energy (or metabolism of sugar) with a nuclear medicine scan called 18F-Flourodeoxy glucose (FDG) positron emission tomography (PET).

To further investigate the relationship between instrumental activities of daily living and brain activity (FDG metabolism), a team led by researchers from Brigham and Women's Hospital (BWH) analyzed data from the Alzheimer's Disease Neuroimaging Initiative database, a multi-center study that BWH has been a part of for nearly 10 years.

They looked at data from 104 clinically normal elderly participants, 203 participants with mild cognitive impairment, and 95 participants with mild dementia due to Alzheimer's disease. The participants had a baseline PET scan to determine brain activity and underwent clinical assessments every 6 to 12 months for up to three years. The participants' study partners (family members or friends who knew them well) also completed questionnaires about the participants' daily living activities.

The researchers found that decreased activity in frontal areas of the brain, which are responsible for cognitive processing and decision making, and deep temporal and parietal (back) areas of the brain, which are associated with memory, were associated with greater impairment of instrumental activities of daily living initially and over time.

"Impairment in activities of daily living is a major source of burden for Alzheimer's disease patients and caregivers alike," said Gad Marshall, MD, BWH Center for Alzheimer Research and Treatment, assistant professor of Neurology at Harvard Medical School, senior study author. "Therefore, detecting these important deficits early on prior to the dementia stage, along with a better understanding of how they relate to changes in the brain, can lead to more effective design of clinical trials that focus on vital patient-centered outcomes. This in turn will ultimately

lead to better treatments prescribed to patients at the early stages of Alzheimer's disease before they are robbed of their faculties and autonomy."

According to the National Institute on Aging, National Institutes of Health, as many as five million people age 65 and older in the United States have dementia due to Alzheimer's disease. As the rapid growth of the aging population continues, the number of those developing the disease is expected to increase significantly, with the number of people with dementia due to Alzheimer's disease doubling for every five-year interval beyond age 65.

Provided by Brigham and Women's Hospital