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Preventing Alzheimer's Disease: What Do We Know?

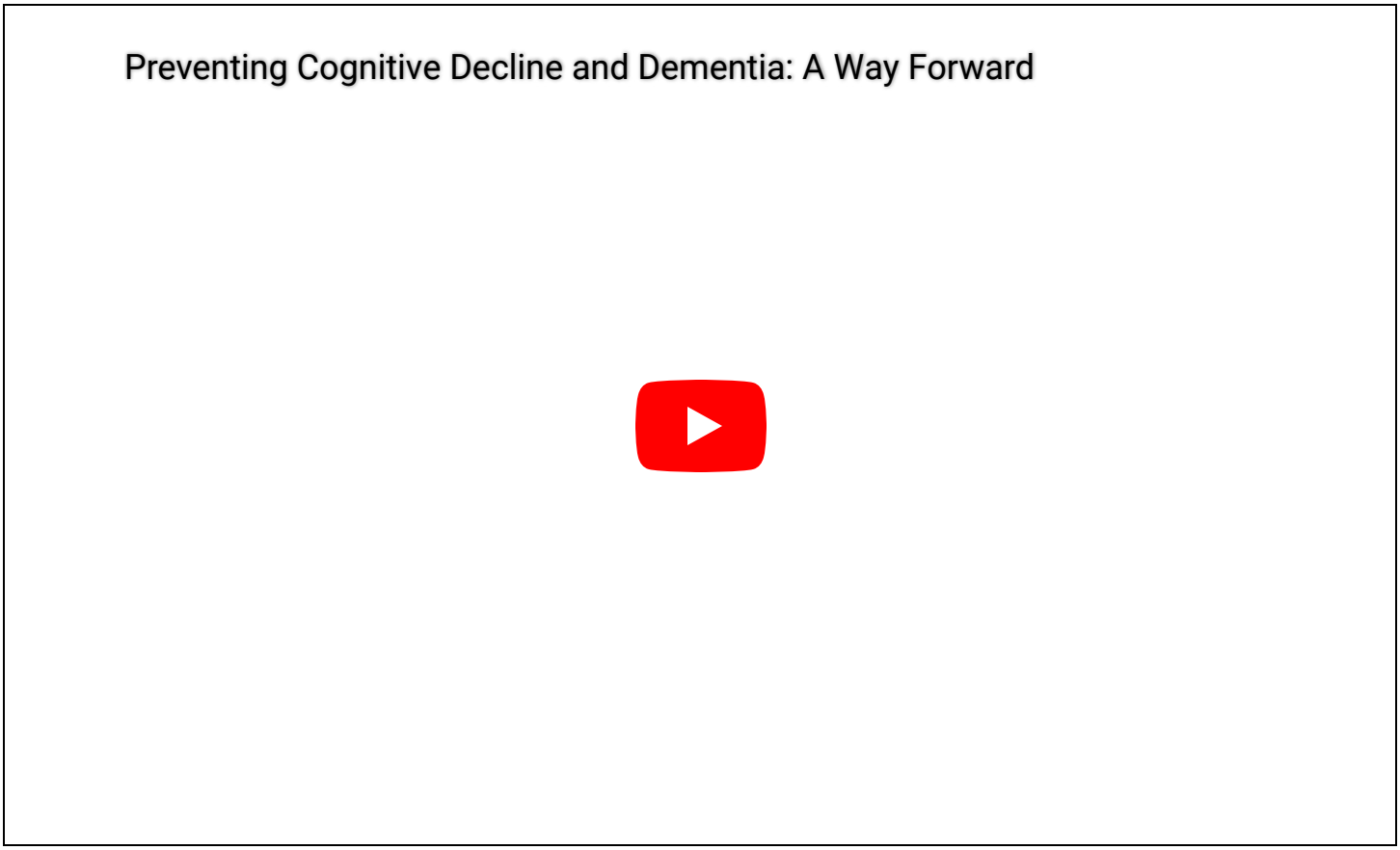
Changes in the brain occur many years before the first symptoms of Alzheimer's disease appear. These early brain changes point to a possible window of opportunity to prevent or delay memory loss and other symptoms of dementia. While nothing has been proven yet to prevent Alzheimer's, researchers have identified promising strategies and are learning more about what might — and might not — work.

A 2017 review of research looked carefully at the evidence from clinical research on ways to prevent, delay, or slow Alzheimer's and mild cognitive impairment (MCI) or delay or slow age-related cognitive decline. Clinical trials are often considered to be the "gold standard" for providing the strongest level of evidence that a treatment or medical approach works. Led by a committee of experts from the National Academies of Sciences, Engineering, and Medicine (NASEM), the review found "encouraging but inconclusive" evidence for three types of interventions: blood pressure management in people with high blood pressure, increased physical activity, and cognitive training.

Read and share this infographic and help spread the word about healthy lifestyle activities that may help reduce your risk of dementia.

Within the context of this study, this meant that the three areas showed promise, but more results from clinical trials would be needed to determine whether these interventions could help prevent these conditions. Researchers are also continuing to explore other possible preventive and risk reduction strategies, including certain foods and diets, diabetes management, sleep quality interventions, and hearing restorative devices, for which we have some but not as much evidence.

The video below highlights conclusions and recommendations from the NASEM review, and the following sections go into more depth on what we know about the most promising interventions to date.



Blood pressure management

Controlling high blood pressure is known to reduce a person's risk for heart disease and stroke, and it also might help prevent or delay Alzheimer's. High blood pressure, particularly in midlife, is considered a risk factor for later-life cognitive decline.

A large, multiyear clinical trial called SPRINT-MIND (Systolic Blood Pressure Intervention Trial: Memory and Cognition in Decreased Hypertension) looked at the effects of lowering blood pressure in more than 8,000 older adults who were 50 years or older and at high risk for cardiovascular disease. Results showed that lowering systolic blood pressure (i.e., the “top” blood pressure number) to below 120 mmHg, rather than the standard 140 mmHg, significantly reduced the risk of MCI. Further, brain scans also showed that this intensive lowering slowed the buildup of white matter lesions — abnormal changes in the brain associated with dementia.

In a study that reviewed data from six individual community-based cohorts, researchers examined the long-term data (average follow-up between seven and 22 years) from roughly 31,000 adults over age 55 that provided further evidence to support the potential of this strategy. The study results showed that managing high blood pressure with blood pressure medication reduced the risk of dementia to the level of a person with normal blood pressure not on blood pressure medication.

However, an observational study of more than 17,000 adults showed that higher systolic blood pressure (particularly at about 185 mmHg) was associated with a *lower* risk of dementia among those age 60 to 70, which is inconsistent with the findings from SPRINT-MIND. Among those 75 years and older, data showed what's called a U-shaped association, in which both high and low blood pressure were associated with lower risk. These findings and others point to the need for further research in how blood pressure levels relate to dementia risk at different ages, as well as cardiovascular risk factors.

While research continues, experts recommend that people control high blood pressure to lower their risk of other serious health problems. Learn more about ways to control your blood pressure.

What do we know about diet and Alzheimer's prevention?

People often wonder if a certain diet or specific foods can help prevent Alzheimer's. The **NASEM review of research** did not find enough evidence to recommend a certain diet, but some healthy eating patterns and diets have been associated with cognitive benefits. Learn more at ***What Do We Know About Diet and Prevention of Alzheimer's Disease?***

Increased physical activity

Physical activity has many health benefits, such as reducing falls, maintaining mobility and independence, and promoting heart health. It reduces the risk of depression, diabetes, high blood pressure, and stroke — health conditions that can contribute to age-related cognitive decline.

Years of animal and human observational studies suggest that exercise may help with brain health and cognitive performance, or how well you think, learn, and remember. No clear link between physical activity and preventing Alzheimer's has been documented. However, preliminary research findings suggest that physical activity may help reduce the risk of age-related cognitive decline.

One study compared cognitive performance in 454 older adults two years prior to death, on average at age 90, and found that higher levels of physical activity were associated with better cognitive function, even after accounting for signs of Alzheimer's in participants' brain tissue. In another study of 1,159 adults age 65 and older that included participants

with high levels of tau protein (a hallmark of Alzheimer's), those who engaged in more physical activity had a slower rate of cognitive decline.

While there is not enough evidence from clinical trials to conclude that exercise can prevent or slow MCI or Alzheimer's, some studies suggest that it may help delay or slow age-related cognitive decline. For example, one study compared aerobic exercise, such as brisk walking or running on a treadmill, to stretching and balance exercises in 65 participants age 50 to 89 with MCI and prediabetes. After six months, the aerobic group had better executive function — the ability to plan and organize — than the stretching/balance group, but not better short-term memory.

Researchers continue to explore physical activity as a possible way to help prevent or delay Alzheimer's. Many questions remain, including whether physical activity can prevent dementia, which types of physical activity, how much, and how often.

In the meantime, it's safe to say that experts already encourage exercise for its many benefits. Read more about exercise and physical activity for older adults or watch a video on the progress of research on exercise and brain health.

> ### What do we know about hearing loss and Alzheimer's prevention?
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> Hearing loss has been linked to greater risk of developing dementia. A **recent analysis** of several studies found that people who used hearing restorative devices (such as hearing aids and **cochlear implants**) had a lower risk of long-term cognitive decline compared to people with uncorrected hearing loss. Additionally, **a recent clinical trial** showed that use of hearing aids reduced the rate of cognitive decline in older adults who were at higher risk for dementia. Learn more about **hearing loss, its health effects, and devices to help**.

Cognitive training

There is evidence suggesting cognitive training may help delay or slow age-related cognitive decline. Cognitive training involves structured activities designed to enhance memory, reasoning, and speed of processing.

Studies, such as the Advanced Cognitive Training for Independent and Vital Elderly (ACTIVE) clinical trial, have shown that specific cognitive training can improve cognitive performance. ACTIVE was a large clinical trial which found that cognitive training improved the abilities of healthy older adults over age 65 (with an average age of 73 years at the start of the study), in the area in which they were trained: memory, reasoning, or speed of processing. Improvements remained in reasoning and speed of processing up to 10 years after the training was completed. It is still unknown whether the long-term

benefits of cognitive training can help enable older people to live independently longer.

A separate analysis of 215 cognitive training clinical trials involving roughly 12,500 older adults showed that cognitive training improved cognition in cognitively healthy older adults and in those who have MCI. Additionally, participants who received training in multiple cognitive areas also improved in cognitive areas in which they had not received training. Cognitive training areas included memory, reasoning, speed of processing, executive functioning, everyday functioning, and general knowledge. Despite the promise of cognitive training, important questions remain around what types and aspects of trainings may be effective and how long the benefits last.

Be wary of claims that playing certain computer and online games can improve your memory and other types of thinking. There is currently not enough evidence available to suggest that any of the commercially offered computer-based brain training applications have the same impact on cognitive abilities as those seen in clinical trials. NIA and other organizations are supporting research to determine whether different types of cognitive training may have lasting effects.

Informal or unstructured cognitively stimulating activities, such as reading, may offer cognitive benefits, as well, according to findings from long-term observational studies. For example, a study of nearly 2,000 cognitively normal adults 70 and older found that playing games and engaging in craft, computer, and social activities were associated with a lower risk of MCI. The same research group also found that playing games and engaging in social activities in both midlife and late life and having a higher number of mentally stimulating activities in late life were associated with reduced MCI risk.

Furthermore, an analysis of 19 cognitive leisure activity studies showed a link between participation in unstructured cognitively stimulating activities and a reduced risk of cognitive impairment and dementia.

Many studies are ongoing to explore cognitive training as a possible way to prevent cognitive decline and dementia. For now, experts encourage people to make healthy lifestyle choices for cognitive health. Learn more about keeping your mind active.

> ### Be cautious about Alzheimer's "cures"
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> Because Alzheimer's is so devastating, some people are tempted by untried or unproven "cures." Check with your doctor before trying pills or any other treatment or supplement that promises to prevent Alzheimer's. These "treatments" might be unsafe, a waste of money, or both. They might even interfere with other medical treatments that have been prescribed.

What does this mean for Alzheimer's prevention?

Alzheimer’s is complex, and the best strategy to prevent it may turn out to be a combination of interventions based on a person’s risk. In the meantime, generally leading a healthy lifestyle, including controlling high blood pressure, being physically active, and making healthy dietary choices, will help reduce your risk of many chronic health conditions and may help reduce your risk of dementia.

Social connections are another important part of leading a healthy lifestyle. Staying connected with friends and family can improve your mental well-being and support healthy aging.

Researchers can't say for certain whether making healthy lifestyle changes will protect against dementia, but taking these steps may help reduce your risk. Visit Alzheimers.gov to learn more about reducing your risk of dementia.

You also can help researchers learn more by participating in research. Clinical trials and studies are looking for all kinds of people — healthy volunteers, cognitively normal participants with a family history of Alzheimer's, people with mild cognitive impairment, and people diagnosed with Alzheimer's or a related dementia. Search the Alzheimers.gov Clinical Trials Finder to find study sites near you.

You may also be interested in

- Learning more about dementia prevention
- Exploring healthy lifestyle changes that may reduce your risk of dementia
- Answering five questions to consider your risk of Alzheimer's

For more information about Alzheimer's

NIA Alzheimer's and related Dementias Education and Referral (ADEAR) Center
800-438-4380
adear@nia.nih.gov
www.nia.nih.gov/alzheimers
The NIA ADEAR Center offers information and free print publications about Alzheimer's and related dementias for families, caregivers, and health professionals. ADEAR Center staff answer telephone, email, and written requests and make referrals to local and national resources.

Alzheimers.gov
www.alzheimers.gov
Explore the Alzheimers.gov website for information and resources on Alzheimer's and related dementias from across the federal government.

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