

Preventing Cognitive Decline and Dementia: A Way Forward

Assesses the current state of knowledge regarding methods to prevent cognitive decline and dementia, suggests priorities for future research in this area, and provides recommendations of content to include in public health messages from the National Institute on Aging.

<p>What it Does</p>	<p>A committee convened by the National Academies of <a href="#">Sciences</a>, <a href="#">Engineering</a>, and <a href="#">Medicine</a> (NASEM) at the request of the <a href="#">National Institute on Aging</a> (NIA) has issued the study report, <a href="#">Preventing Cognitive Decline and Dementia: A Way Forward</a>, in response to concern about both the detrimental effects of aging on the brain (i.e., "cognitive decline", <a href="#">2015 NASEM report on aging</a>) and <a href="#">dementia</a>, a disease process in which cognitive decline interferes with everyday life.</p> <p>Here, the committee sought to assess the current state of evidence-based methods (i.e., "interventions") aimed at preventing cognitive decline and dementia. Experts first reviewed the results of a broad range of randomized control trials (RCTs), which represent the highest standard for evidence in developing new clinical interventions, and then supplemented RCT evidence with additional evidence from other studies.</p> <p>These experts identified priorities across four domains: public health messaging, high and additional priorities for future research, and methodological improvements.</p> <ul style="list-style-type: none"> <li>• First, they identified 3 evidence-based interventions with varying levels of effectiveness depending on the severity of the cognitive decline. Specifically, cognitive training, blood pressure management, and physical exercise were highlighted as interventions with "encouraging but inconclusive" evidence that could shape how NIA and other healthcare providers treat, study, and publicly discuss cognitive decline. These experts emphasize that the evidence is not strong enough to support new public health campaigns from the NIA, but suggest that health providers and the NIA provide appropriate information to the public about these three interventions.</li> <li>• Second, these experts suggest that the NIA continue to support additional research into the effectiveness of these three encouraging interventions.</li> <li>• Third, they also suggest that the NIA support research examining the effectiveness of new anti-dementia treatments, diabetes treatments, depression treatments, dietary interventions, lipid-lowering treatments, sleep quality interventions, social engagement interventions, and vitamin B12 plus folic acid supplements, because the current evidence on these treatments and interventions is inconclusive.</li> </ul>
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	<ul style="list-style-type: none"> <li>• Fourth, finally, they recommend that the NIA support research that uses the best methodological practices, such as tailoring interventions based on individual-specific risk factors for cognitive decline; recruiting individuals from diverse populations; starting interventions earlier in an attempt to prevent, and not just delay, cognitive decline; using consistent behavioral measures across studies to better understand cognitive decline; and testing the validity of interventions with large samples from real-world, clinical or community settings.</li> </ul>
<p>Relevant Science</p>	<p>Age-related cognitive decline, or <a href="#">cognitive aging</a>, refers to the natural changes that occur in the brain as one ages, resulting in a deterioration of certain cognitive functions (e.g., memory becomes less reliable). The severity of cognitive decline exists on a continuum. For instance, if other individuals (e.g., clinicians, caregivers, or relatives) have noticed the decline, but it has yet to significantly affect everyday life, an older adult might have "<a href="#">Mild Cognitive Impairment</a>" (MCI). However, if this decline causes a loss of independence in everyday life, an older adult might have <a href="#">Clinical Alzheimer's-type Dementia</a>. As such, the study committee sought to review the research with an eye toward preventing, delaying, or slowing both MCI and Clinical Alzheimer's-type Dementia, and only delaying or slowing age-related cognitive decline, since cognitive aging is universal and expected.</p> <p>Methodologically, the committee focused primarily on <a href="#">intervention studies</a>, which refer to studies in which treatments (e.g., a drug) are typically randomly assigned to individuals relative to a control or placebo program, allowing experimenters to test whether that intervention is effective against the condition in question (e.g., age-related cognitive decline, MCI, Clinical Alzheimer's-type Dementia). While interventions can have short-term effects, such as boosting specific kinds of memory for a few weeks, the committee focused primarily on interventions with proven long-term effects in preventing and delaying cognitive decline. The committee further discussed the effect of <a href="#">risk factors</a>, which refer to characteristics that change in the likelihood of developing a condition. Finally, when evidence from intervention studies was lacking, the committee reviewed observational studies, which do not experimentally manipulate the assignment of individuals to a study condition, but might instead, for example, examine the correlation between a condition and risk factor.</p> <p>The committee identified 3 promising evidence-based interventions: cognitive training, blood pressure management, and physical exercise.</p> <p>Cognitive training refers to structured training exercises intended to improve particular cognitive functions, such as memory and problem solving. Its effectiveness in delaying or slowing age-related cognitive decline is related to improving the trained cognitive function and independence in daily activities, and is supported by evidence from both randomized control trials and observational studies. Importantly, however, the evidence supporting</p>



	<p>cognitive training cannot be generalized to include brain games that have been popularized in the media, where evidence remains inconclusive. Nor does the training result in generalized improvements across domains (i.e., memory training does not result in improved problem solving).</p> <p>Unlike cognitive training, both blood pressure management and physical exercise are recommended primarily because their neurobiological effects are well documented, with observational studies, instead of randomized control trials, providing encouraging evidence. With blood pressure management, the committee focuses specifically on people who have <a href="#">hypertension</a>, and suggests that blood pressure management may help prevent, delay, or slow Clinical Alzheimer’s-type Dementia by providing cardiovascular benefits. Finally, although the effects of exercise duration, type, and frequency are not yet fully understood, the committee concluded that increased physical exercise can help delay or slow age-related cognitive decline by providing health benefits.</p> <p>Of note, the committee did not find conclusive evidence that a treatment that works to delay age-related cognitive decline also works to prevent Clinical Alzheimer’s-type Dementia and MCI or vice versa. Future research is required to determine whether this is biologically plausible.</p>
<p>Why it Matters</p>	<p>According to the <a href="#">US Census Bureau</a>, about 1 in 5 Americans will be sixty-five years and older by 2029. As the baby boomer generation ages and the need for healthcare devoted to this aging populace grows, government agencies, academic researchers, and others have sought to find evidence-based strategies to prevent or delay the detrimental effects of aging on the brain. Until <a href="#">Preventing Cognitive Decline and Dementia: A Way Forward</a>, previous efforts did not find sufficient evidence to make recommendations that would shape the policy landscape on cognitive aging. However, recent evidence has suggested, but not definitively concluded, that some evidence-based interventions may be more effective than others at preventing cognitive decline.</p> <p>This is especially important because 1 in 8 older Americans experiences "confusion or memory loss that is happening more often or is getting worse" over a 12-month period (<a href="#">Centers for Disease Control and Prevention, 2013</a>). Yet, according to a <a href="#">2012 survey by the AARP</a>, more than 4 out of 5 older adults believe that they can proactively manage their health beyond taking medication to slow the effects of aging. <a href="#">Preventing Cognitive Decline and Dementia: A Way Forward</a> is an attempt to make recommendations for how public agencies and researchers study, treat, and discuss cognitive decline so that older adults can retain agency in their everyday lives.</p>

[Relevant Experts]	<p><a href="#">Daniel Blazer, M.D., Ph.D.</a> Dr. Blazer served as a committee member for the study report, <a href="#">Preventing Cognitive Decline and Dementia: A Way Forward</a>. He also chaired an <a href="#">Institute of Medicine committee on cognitive aging</a>, which he and Dr. Wallace <a href="#">reviewed here</a>.</p>
Background	<p>In 2010, the Agency for Healthcare Research and Quality (AHRQ) and a National Institutes of Health (NIH) conference were unable to recommend any specific interventions on treating cognitive decline and dementia due to a lack of sufficient evidence. Five years later, the National Institute on Aging (NIA) commissioned the AHRQ to review the current evidence once more, incorporating recent advancements in understanding dementia and the effects reported from recently published clinical trials for preventive interventions. <a href="#">Preventing Cognitive Decline and Dementia: A Way Forward</a> represents this advancement in scientific knowledge.</p>
Endorsements & Opposition	<p>Endorsements:</p> <ul style="list-style-type: none"> <li>• Senator Susan Collins (R-MA), <a href="#">press release</a>, June 23, 2017: “This report elevates what we know about preventing cognitive decline and dementia. We still have more questions than answers; but the news is promising. It has long been known that physical activity is good for the body – now we can say that it is good for the brain and may delay cognitive decline, too.”</li> <li>• Alan I. Leshner (report committee chair and <a href="#">AAAS</a> CEO emeritus), <a href="#">press release</a>, June 22, 2017: “There is good cause for hope that in the next several years much more will be known about how to prevent cognitive decline and dementia, as more clinical trial results become available and more evidence emerges. Even though clinical trials have not conclusively supported the three interventions discussed in our report, the evidence is strong enough to suggest the public should at least have access to these results to help inform their decisions about how they can invest their time and resources to maintain brain health with aging.”</li> </ul> <p>At present, there has not been any publicly reported opposition to this report.</p>
[Status]	<p>The report was published on June 22, 2017.</p>
[Related Policies]	<p>The <a href="#">Global Council on Brain Health</a> from the AARP has released <a href="#">a set of recommendations</a> on <a href="#">physical activity</a>, <a href="#">social engagement</a>, <a href="#">sleep</a>, <a href="#">cognitively stimulating activities</a>, and <a href="#">nutrition</a> based on this report and other research.</p>

	<p><a href="#">H.R.4621 – Global Brain Health Act of 2017</a>: This bill was introduced in the House on December 12, 2017 as a means of gathering support for programs dedicated to individuals living with Alzheimer’s and other forms of dementia.</p> <p><a href="#">H.R. 4957 – Concentrating on High-Value Alzheimer’s Needs to Get to an End (CHANGE) Act of 2018</a>: This bill was introduced in the House on February 7, 2018 as a means of gathering support for programs dedicated to people living with Alzheimer’s and related dementias and their family caregivers as well as galvanizing research on treatments and prevention strategies.</p>
Organizations	<p>This committee was initiated by the <a href="#">National Institute on Aging</a> (NIA), with the National Academies of <a href="#">Sciences</a>, <a href="#">Engineering</a>, and <a href="#">Medicine</a>. The 17 committee members are listed in the study report, <a href="#">Preventing Cognitive Decline and Dementia: A Way Forward</a>. Alan I. Leshner, Story Landis, Clare Stroud, and Autumn Downey served as editors.</p>
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