

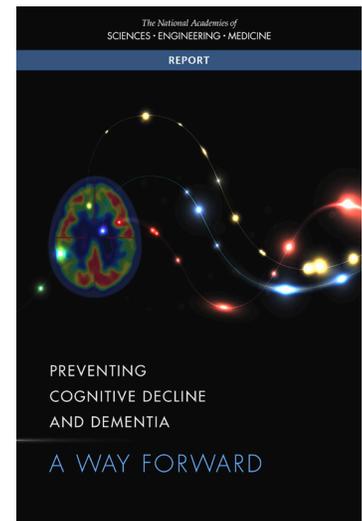
June 2017

Preventing Cognitive Decline and Dementia: A Way Forward

Cognitive impairment, including clinical Alzheimer’s-type dementia (CATD), mild cognitive impairment (MCI), or age-related cognitive decline (ARCD), affects many older adults. Although much remains unknown about preventing, delaying onset, or slowing progression of these conditions, a growing body of research is emerging that may inform decision making by consumers, patients, clinicians, and public health practitioners.

In 2015, the National Institute on Aging (NIA) asked the National Academies of Sciences, Engineering, and Medicine to participate in a two-part project focused on examining the evidence on the effectiveness, comparative effectiveness, and harms of interventions for preventing, slowing, or delaying the onset of MCI and CATD, and delaying or slowing ARCD. NIA contracted with the Agency for Healthcare Research and Quality (AHRQ) to conduct a systematic review of the evidence. NIA also asked the National Academies to convene an expert committee to help inform the design of AHRQ’s systematic review and then use the results to make recommendations to inform the development of public health messaging, as well as recommendations for future research.

In the resulting report, *Preventing Cognitive Decline and Dementia: A Way Forward*, the committee applies AHRQ’s highly refined systematic review process to assess the state of the evidence on the effectiveness of preventive interventions, examining how that evidence might serve as a basis for communication with the public about steps that can be taken to prevent, slow, or delay the onset of MCI and CATD—and delay or slow ARCD. The report also makes recommendations for future research to improve methodologies and advance understanding of the effectiveness of interventions.



This report assesses the state of the evidence on the effectiveness of preventive interventions for clinical Alzheimer’s-type dementia, mild cognitive impairment, and age-related cognitive decline.

COMMUNICATING WITH THE PUBLIC ABOUT PREVENTIVE INTERVENTIONS

The AHRQ systematic review did not identify any specific interventions with enough evidence to justify mounting an assertive public health campaign to encourage people to adopt them for preventing cognitive decline and dementia. Based on findings from the systematic review and other supplemental data sources, however, the committee concluded that beneficial effects of the following three classes of interventions are supported by encouraging, although inconclusive, evidence: cognitive training, blood pressure management in people with hypertension, and increased physical activity.

In communications with the public, the committee recommends the National Institutes of Health and others provide accurate information about the potential impact of these three intervention classes on cognitive outcomes in a place where people can access it (e.g., websites). It also is appropriate for public health practitioners and health care providers to include mention of the potential cognitive benefits of these interventions when promoting their adoption for the prevention or control of other diseases and conditions.

Cognitive training

The term “cognitive training” is used to indicate a broad set of interventions, including those aimed at enhancing reasoning (e.g., problem solving), memory, and speed of processing (e.g., speed of identifying visual information on a screen). Such structured training exercises may or may not be computer based.

Some evidence from the AHRQ review, based largely on a single, long-duration clinical trial, indicated that cognitive training can improve long-term cognitive function and maintenance of independence in instrumental activities of daily living in adults with normal cognition. While inconclusive, this encouraging evidence supports communicating about cognitive training as a tool for delaying or slowing ARCD.

At present, there is no evidence to support the notion that these kinds of beneficial long-term cognitive effects are obtained with commercial, computer-based “brain training” applications, which appear to have short-term benefits that apply only to the specific cognitive task that is rehearsed.

There is no evidence at this time to support a conclusion that cognitive training can prevent or delay MCI or CATD, and future research in this area will be important.

Blood pressure management for people with hypertension

Multiple links exist among cerebrovascular disease, Alzheimer’s disease, and dementia. A majority of dementia patients show signs of cerebrovascular disease. Improved control of blood pressure in patients with hypertension has been linked to declines in stroke incidence and mortality, and it is plausible that blood pressure management would also reduce the risk of dementia and cognitive decline.

Although clinical trial data have been inconsistent, when complementary data from prospective cohort studies and knowledge of the natural history and biology of the disease are considered, the whole of the evidence suggests that managing blood pressure for people with hypertension, particularly during midlife (ages 35 to 65 years), is supported by encouraging but inconclusive evidence for preventing, delaying, and slowing CATD.

Increased physical activity

Physical activity has many well-documented health benefits and has consistently been identified as one of the modifiable risk factors that could have the greatest impact on rates of cognitive impairment and dementia. The AHRQ systematic review indicated that the pattern of clinical trial results suggests increased physical activity may be effective in delaying or slowing ARCD—although the results were not consistently positive. Considering supplemental data from prospective cohort studies and knowledge of neurobiological processes, the committee concluded that increased physical activity for delaying or slowing ARCD is supported by encouraging but inconclusive evidence.

There is not enough evidence at this time to conclude whether increasing physical activity prevents, delays, or slows MCI or CATD, as few studies examined these outcomes.

The subject of this report is a vibrant, dynamic research area whose story is not complete. ... 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.

A WAY FORWARD

To overcome the limitations of past studies and generate a stronger evidence base going forward, the committee identifies the need for improvements in the methodologies of future intervention studies. These include ensuring that interventions are evaluated in a diverse set of populations, with variation across racial and ethnic backgrounds, socioeconomic status, age at the time the intervention starts, and risk of dementia. It is also important to consider approaches that can improve the evidence base while achieving greater efficiencies.

Before developing public health strategies that strongly encourage the adoption of cognitive training, blood pressure management, and increased physical activity for the purpose of maintaining cognitive function, additional research is needed to further understand and gain confidence in the effectiveness of these interventions. The committee recommends that the National Institutes of Health and others support further research to strengthen the evidence base on these interventions.

Research should also be conducted on other interventions for which there is currently not enough evidence to determine impact on cognitive decline and dementia. These include:

- new antidementia treatments that can delay onset or slow disease progression,
- diabetes treatment,
- depression treatment,
- dietary interventions,
- lipid-lowering treatment/statins,
- sleep quality interventions,
- social engagement interventions, and
- vitamin B12 plus folic acid supplementation.

CONCLUSION

The subject of this report is a vibrant, dynamic research area whose story is not complete. The fact that the report does not strongly support a public health campaign focused on actively promoting adoption of any type of intervention should not be taken to reflect a lack of progress or prospects for preventing or delaying the discussed conditions. Clinical trials and other studies have yielded encouraging data for some interventions, and the public should have access to this information to inform choices on how to invest time and resources to maintain brain health with aging.

More evidence is emerging all the time. As the results of current and future clinical trials become available, it will be critical to assess them with an eye to updating the recommendations presented here for communicating with the public. 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.

To read the full report, please visit:

[nationalacademies.org/Dementia](https://www.nationalacademies.org/Dementia)

Committee on Preventing Dementia and Cognitive Impairment

Alan I. Leshner (Chair)
American Association for the
Advancement of Science

Story Landis (Vice Chair)
National Institute of
Neurological Disorders and
Stroke

Marilyn Albert
Johns Hopkins University
School of Medicine

Lisa L. Barnes
Rush University Medical Center

Dan G. Blazer
Duke University Medical Center

Mark A. Espeland
Wake Forest School of Medicine

J Taylor Harden
National Hartford Center of
Gerontological Nursing
Excellence

Claudia H. Kawas
University of California, Irvine

Nan M. Laird
Harvard University

Kenneth M. Langa
University of Michigan

Eric B. Larson
Kaiser Foundation Health Plan
of Washington

José A. Luchsinger
Columbia University

Ronald C. Petersen
Mayo Clinic College of
Medicine

Ralph L. Sacco
University of Miami

Sudha Seshadri
Boston University School of
Medicine

Leslie B. Snyder
University of Connecticut

Kristine Yaffe
University of California,
San Francisco

Study Sponsor

National Institute on Aging
(National Institutes of Health,
U.S. Department of Health and
Human Services)

Study Staff

Clare Stroud
Study Director
(until April 2017)

Autumn Downey
Study Director
(since April 2017)

Sheena M. Posey Norris
Program Officer

Benjamin Kahn
Research Associate

Olivia Yost
Research Associate

Daniel Flynn
Senior Program Assistant

Andrew Pope
Director, Board On Health
Sciences Policy

Health and Medicine Division

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