

VIEWPOINT

Cognitive Aging

A Report From the Institute of Medicine

Dan G. Blazer, MD, MPH, PhD

School of Medicine,
Duke University,
Durham, North
Carolina.

Kristine Yaffe, MD

School of Medicine,
University of California
at San Francisco.

Jason Karlawish, MD

Perelman School of
Medicine, University of
Pennsylvania,
Philadelphia.



Author Reading at
jama.com

Corresponding

Author: Dan G. Blazer, MD, MPH, PhD, Division of Community and Family Medicine, Department of Psychiatry and Behavioral Sciences, Duke University Medical Center, 3521 Hospital S, PO Box 3003, Durham, NC 27710 (blaze001@mc.duke.edu).

The **Institute of Medicine** recently released a report entitled *Cognitive Aging: Progress in Understanding and Opportunities for Action*, which addresses the emerging concept of cognitive aging, the importance of this issue for the nation's public health, and actions the nation needs to take to better understand and maintain the cognitive health of older adults.¹

Cognitive aging is a lifelong process of gradual, ongoing, yet highly variable changes in cognitive function that occur as people get older. Some cognitive functions decrease predictably, such as memory and reaction time, whereas some other functions are either maintained or may even increase, such as wisdom and knowledge. Characteristics of cognitive aging are presented in the Box.

Cognitive aging is not a disease or a quantifiable level of dysfunction. It is distinct from Alzheimer disease and other neurocognitive and psychiatric disorders that affect older adults' cognitive health, so it is best measured and studied longitudinally among adults who are free of these disorders. Animal models of aging demonstrate that neurons do not die with aging, but their synaptic structure and function are diminished, particularly in prefrontal cortical regions. The committee that prepared the report on cognitive aging concluded this finding is important because it suggests the possibility for improving cognitive health.

Cognition and cognitive health are matters of the life span. Cognitive health is described as the maintenance of optimal cognitive function with age. The evidence showed that cognitive aging and its influence on cognitive health are matters of pressing public health importance.

Individuals are deeply concerned about declines in memory and decision-making abilities as they age. They may worry that these declines are early signs of a neurodegenerative disease, particularly Alzheimer disease, and they fear losing their independence and a worsening quality of life. Maintenance of cognitive function, or "staying mentally sharp," may be the primary health concern of older adults.² Cognitive decline also affects older adults' family members and friends, who are concerned about the older person's continued ability to drive or make financial decisions and who often are called to assist them even if the older adult does not meet criteria for a diagnosable disorder.

An individual and society can be affected by cognitive aging because of 2 issues. First, older adults lose an estimated \$2.9 billion a year, directly and indirectly, to financial fraud.³ To address this, the committee called for financial institutions and relevant government agencies to develop and improve programs and services used by older adults to help them avoid exploitation, opti-

mize independence, and make sound financial decisions. Second, older adults may develop problems with driving, especially because reaction time is critical and decision making must be at times almost instantaneous. Although most older adults are more experienced drivers, their driving capability may be compromised and recognition of these deficits and programs to help correct them will be essential.

Although the study of cognitive aging, especially clinical trials of interventions, is in its infancy, well-designed studies support some actions that individuals can take to promote their cognitive health: be physically active; reduce and manage cardiovascular disease risk factors, including high blood pressure, diabetes, and smoking; and regularly discuss and review with a health care professional the medications that might influence cognitive health. None of these findings are unique to cognitive aging—each is good advice for many health conditions—yet the finding that these actions may promote cognitive health as persons age emphasizes the importance of public health resources and programs to promote them. Although the evidence is not as strong, other actions may promote cognitive health: be socially and intellectually active; continually seek opportunities to learn; get adequate sleep; and seek professional treatment for sleep disorders, if needed.

Health care systems and health care professionals will play a key role in educating patients and their families about cognitive aging and in implementing interventions to ensure optimal cognitive health across the life cycle. The committee noted the importance of programs to avoid delirium associated with medications or hospitalizations. Educating the patient and family members should include these clear messages: the brain ages, just like other parts of the body; cognitive aging is not a disease; cognitive aging is different for every individual (there is wide variability across persons of similar age); some cognitive functions improve with age and neurons are not dying as in Alzheimer disease (hence, realistic hope is inherent in cognitive aging); and patients can take certain steps to help protect their cognitive health.

Society can also contribute to cognitive health. The committee recommended that the US Food and Drug Administration and Federal Trade Commission should determine the appropriate regulatory review, policies, and guidelines for products advertised to consumers to improve cognitive health, such as medications, nutritional supplements, and cognitive training. Many medications and brain-stimulating activities are being marketed directly to the public. Even though the committee did not evaluate each of these separately, it did

Box. Characteristics of Cognitive Aging

Key Features

Inherent in humans and animals as they age

Occurs across the spectrum of individuals as they age regardless of initial cognitive function

Highly dynamic process with variability within and between individuals

Includes some cognitive domains that may not change, may decline, or may improve with aging, and there is the potential for older adults to strengthen some cognitive abilities

Only now beginning to be understood biologically yet clearly involves structural and functional brain changes

Not a clinically defined neurological or psychiatric disease and does not inevitably lead to neuronal death and neurodegenerative dementia (such as in Alzheimer disease)

Risk and Protective Factors

Health and environmental factors over the life span influence cognitive aging

Modifiable and nonmodifiable factors include genetics, culture, education, medical comorbidities, acute illness, physical activity, and other health behaviors

Cognitive aging can be influenced by development beginning in utero, infancy, and childhood

Assessment

Cognitive aging is not easily defined by a clear threshold on cognitive tests because many factors—including culture, occupation, education, environmental context, and health variables (eg, medications)—influence test performance and norms

For an individual, cognitive performance is best assessed at several points in time

Effect on Daily Life

Day-to-day functions may be affected, such as driving, making financial and health care decisions, and understanding instructions given by health care professionals

Experience, expertise, and environmental support aids (eg, lists) can help compensate for declines in cognition

The challenges of cognitive aging may be more apparent in environments that require individuals to engage in highly technical and fast-paced or timed tasks, situations that involve new learning, or stressful situations (eg, emotional, physical, or health-related) and are less apparent in highly familiar situations

find that overall the evidence for their effectiveness, especially the transfer of cognitive gains to real-life situations and the long-term benefit of the interventions, remains to be clearly demonstrated. Nevertheless, new data will undoubtedly emerge and could allow better evaluation of these interventions.

Cognitive aging is not a disease, but it is a major public health issue. Despite the public health importance of cognitive aging, there is limited research available on this process, especially research into basic biological mechanisms leading to cognitive

aging and research into potential interventions through controlled clinical trials. The activities of multiple groups—advocacy groups, research organizations, government agencies, communities, health care professionals, senior centers, financial institutions, and departments of transportation—will be necessary for society to both better understand cognitive aging and promote cognitive health in later life. Patients are already concerned. The time has come for physicians, other health care professionals, and researchers to enter the conversation with them.

ARTICLE INFORMATION

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