

Memory Assessment, Screening and Testing Tools

Computerized Cognitive Assessment Products



Neurocognitive Screening for ADHD,
Alzheimer's, Dementia, Memory Loss,
Concussion, Traumatic Brain Injury

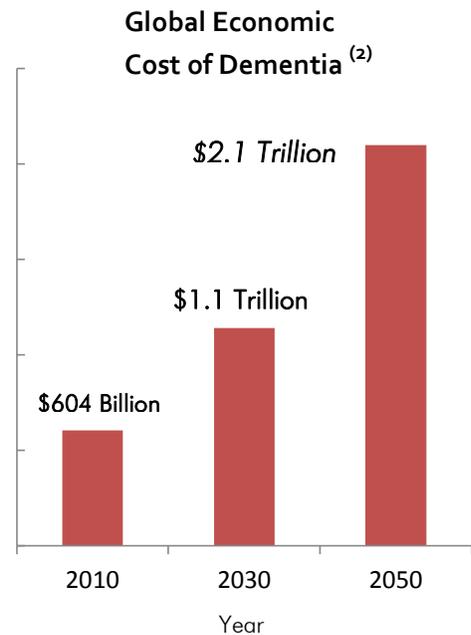
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EXECUTIVE SUMMARY

Key Drivers for Computerized Memory Assessment & Cognitive Testing:

A \$2 Trillion Global Economic Cost of Dementia. In 2010, the worldwide cost of dementia was estimated at US\$604 Billion.⁽¹⁾ The global economic cost of dementia is expected to balloon to **US\$1.1 Trillion by 2030, and US \$2.1 Trillion by 2050.** The number of seniors (age 65+) is expected to be over 1.5 billion people by 2050 - dementia rates begin to rise sharply in this population group after age 75. Having reliable, easy to use tools to screen for memory and cognitive impairment will become increasingly important.

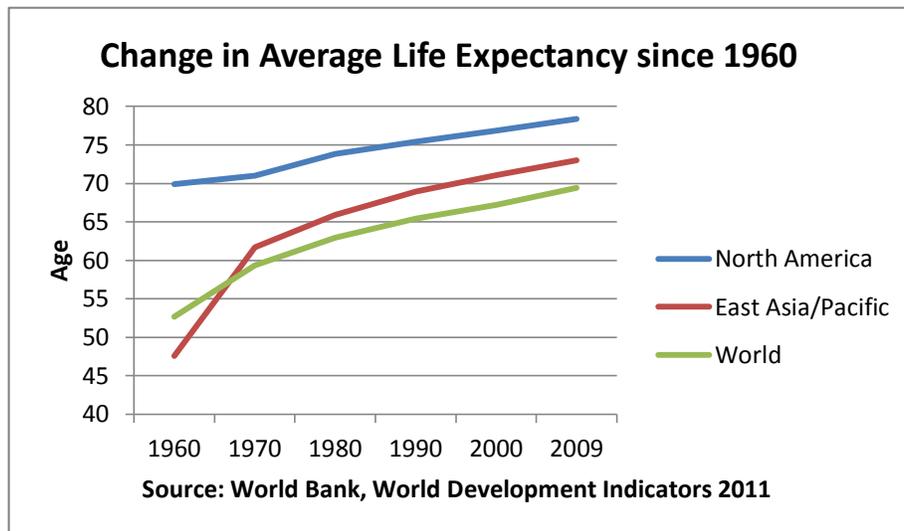


Increased Awareness of Cognitive Health Issues. Constant news stories have highlighted the negative long term cognitive health outcomes of multiple concussions in team sports. Parents, schools, and physicians require tools to screen and treat children with Autism Spectrum Disorder or ADHD (which many times overlap.) Standardized cognitive screening tools will help support diagnostic certainty and treatment.

Rapid Advances in Technology Platforms. Tablet devices with secure wireless access to “big data” psychometric norms and reports are augmenting, and in some cases replacing large, stationary desktop PC platforms. Portable cognitive screening can begin to move into the field and be rapidly configured in health care practice and home use settings.

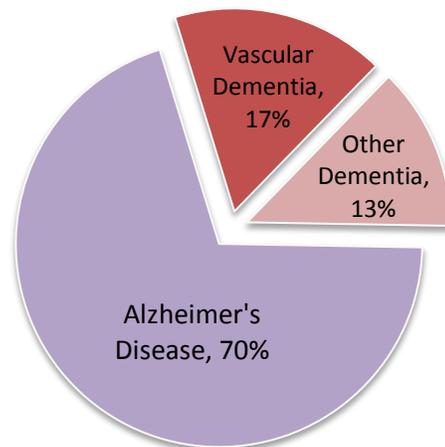
RISING DEMENTIA RATES ARE A GLOBAL HEALTH TREND

A positive aspect of rising living standards in most of the world has been a significant improvement in average worldwide life expectancies, increasing from 52 years in 1960 to 69 years in 2009. Regional differences are even more striking -- the average life expectancy for a person living in North America has risen from 70 years in 1960 to 78 years in 2009, while the life expectancy in East Asia & Pacific countries as a group has grown from 47 years to 73 years during this same period. ⁽³⁾



TYPES OF DEMENTIA

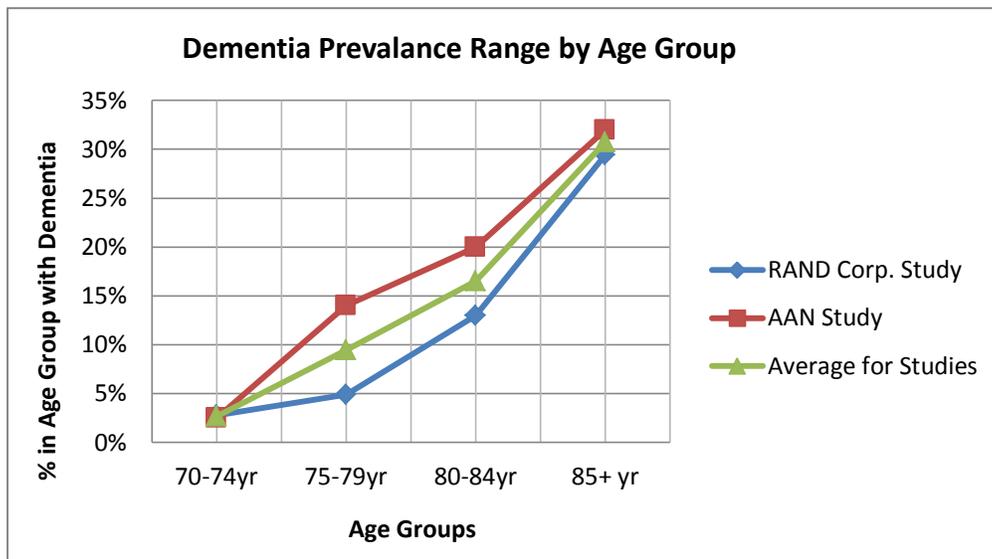
Dementia is an age related, progressive neurocognitive disorder. Dementia encompasses several subtypes, including Alzheimer's disease (about 70% of all cases), vascular dementia, dementia with Lewy bodies, and frontotemporal dementia. Mixed dementia, such as Alzheimer's with vascular dementia, is also a common subtype.



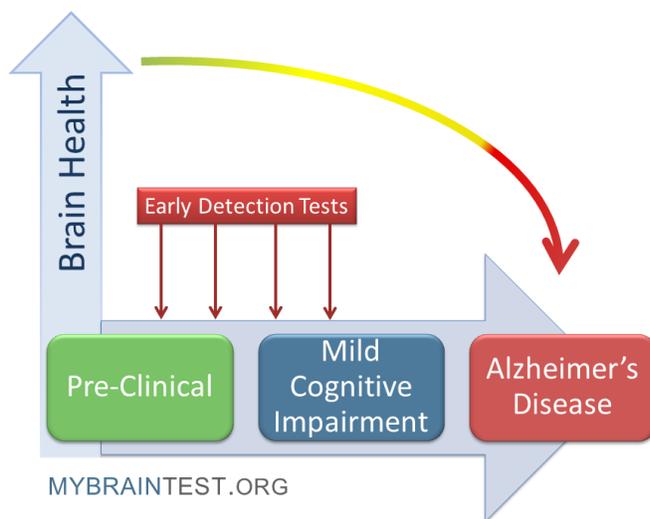
Plassman, et al, Prevalence of Dementia in the United States, *Neuroepidemiology* 2007, 29: 125-132

DEMENTIA RISK INCREASES WITH AGE

The RAND Corporation and American Academy of Neurology (AAN) have recently conducted national dementia prevalence studies.^(4,5) The results from these studies show that *the rate of dementia increases significantly in age groups of 75 years and older*:



EARLY DETECTION AND DIAGNOSIS METHODS FOR DEMENTIA



An increased research focus on methods of testing for Alzheimer's disease has yielded a number of approaches for detecting disease markers before obvious signs of cognitive impairment appear. The goal is to detect subtle signs in the **Pre-Clinical** or **Mild Cognitive Impairment** phases. [Computerized cognitive screening](#) is ideally suited for this purpose.

MEASURING COGNITIVE HEALTH AT ALL AGES

CONCUSSION AND TRAUMATIC BRAIN INJURY

Every year in the United States, at least **1.7 million** people sustain a traumatic brain injury (TBI) or concussion that is severe enough to require medical evaluation. Sports-related hospital emergency department (ER) admissions total 250,000 per year.⁽⁶⁾ American football, soccer, and cycling are the top activities that bring children and teenagers to the ER for concussion and brain injury symptoms.

High risk occupations such as military service also contribute to TBI rates. Several studies have indicated TBI rates of around 10%-20% from the 2001-2009 Iraq & Afghanistan deployments, or about 150K to 300K service members.⁽⁷⁾ Problems with memory, focus, attention, balance and coordination are very common among service members with blast related TBI.

A serious lack of TBI assessment tools is now beginning to be addressed by products like the Defense Automated Neurobehavioral Assessment (DANA) system and BrainFx.

AUSTISM SPECTRUM DISORDER AND ADHD

In May 2013, U.S. Centers for Disease Control (CDC) published a comprehensive summary of the epidemiology of childhood brain disorders, including Autism Spectrum Disorder, and Attention-deficit/hyperactivity disorder (ADHD).⁽⁸⁾ Key findings from the study include:

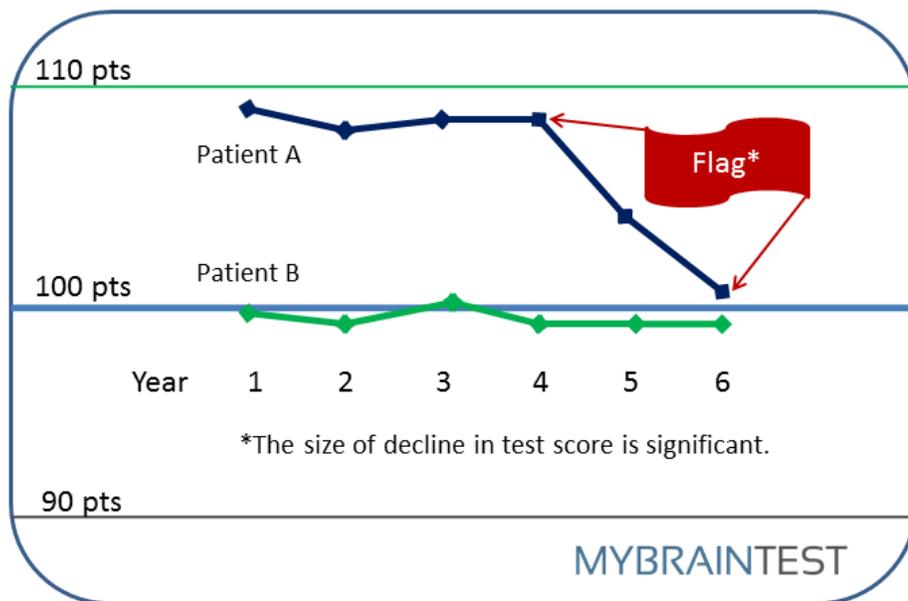
- Over **5 million** children aged 3-17 in the US have been diagnosed with ADHD. Boys are more than twice as likely as girls to receive an ADHD diagnosis.
- Nearly **1 million** children aged 3-17 in the US have been diagnosed with Autism Spectrum Disorder (ASD). The male predominance rate of ASD is 3.5 to 4.5 times higher than the female ASD rate.

Standardized cognitive screening tools for ASD and ADHD can help support diagnostic certainty and inform treatment options.

TECHNOLOGY ADVANCES ENABLE PERSONAL COGNITIVE HEALTH MARKERS

A significant advantage of [computerized cognitive screening](#) is the ability to create a baseline cognitive performance test, with annual re-tests, to establish a patient's cognitive health history. Below is an illustrative example of **routine memory testing for Patient A and Patient B**:

Memory Testing Example - Annual Cognitive Screening



Notice the large drop in Patient A's test scores in years 4 thru 6. This performance drop would likely be a significant "flag" for the reviewing clinician, resulting in more detailed diagnostic tests to determine the cause of this sharp drop in Patient A's memory performance. However, the best way for a physician to know about this cognitive health problem is by being able to review the history of Patient A's cognitive screening results, seeing the sharp drop in recent memory scores.

The potential for routine, large scale population screenings are being driven by preventive health initiatives like the **Medicare Annual Wellness Visit (AWV)**, which includes "detection of any cognitive impairment." The AWV is available to over 60 million Medicare members.

ABOUT THE REST OF THIS REPORT

The remainder of this report contains detailed information on computerized memory assessment and cognitive testing tools, including **supported technology platforms, cognitive testing methods, and testing categories:**

Primary Use Table – Computerized Cognitive Testing Tools

Neurodegenerative Disorders	Concussion and TBI	Neuropsychiatric Disorders
Screening for Neurodegenerative Disorders (Alzheimer’s, Dementia, MCI, episodic memory impairment)	Screening for concussion and traumatic brain injury (TBI) symptoms	Screening for Neuropsychiatric Disorders (ADHD, depression, schizophrenia, etc)
●	●	●
●	Secondary use	
●		●

Test Administration Methods			Supported Platforms		
Administered by trained clinician	Self administered- at home, work	Test results are computer scored	Test is online – web browser	Test is a Tablet App.	Test is a PC/Mac App.
●		●		●	
	●	●	●		
●		●			●

General pricing information, along with cognitive assessment test report samples from many of these products are included.

More information on the full report: www.mybraintest.org/product-reports/

Curious About Your Brain? Try the free [Healthy Brain Test](http://www.mybraintest.org/healthy-brain-test/) and learn about your individual risk factors for Alzheimer’s disease, along with useful tips for keeping your brain in good health: www.mybraintest.org/healthy-brain-test/