

**THE ENHANCED
MENTAL SKILLS
TEST (EMST)**

**SETTING A NEW STANDARD IN
COGNITIVE SCREENING ACCURACY**



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BRACING FOR BOOMERS

As today's 77 million baby boomers quickly age into tomorrow's senior citizens, a huge challenge faces families, employers, insurers and providers alike: how to assure that seniors can live independently as long as possible. This challenge arises from the fact that aging is the #1 risk factor for dementia, the leading disorder in preventing independent living.

The financial repercussions associated with this challenge are staggering. The average lifetime

cost of care for an individual with Alzheimer's is currently \$174,000¹ - and rising every year. Without effective screening to accurately identify the early stages of dementia, prevention becomes impossible and treatment less effective.

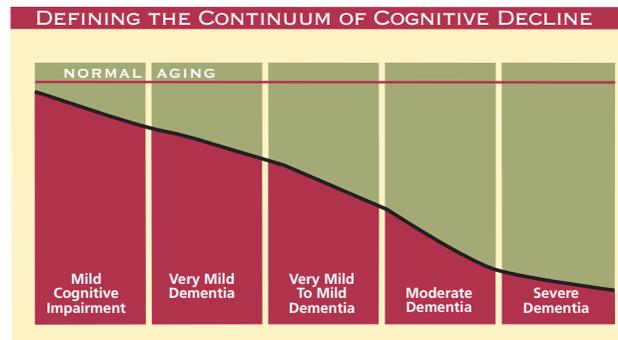
MARKET BOOM OR BUST

The earliest stages of a dementing disorder - called Mild Cognitive Impairment (MCI) - can exist for an average of seven years before observable symptoms rob a person's ability to perform essential tasks and function independently. Each year during this period, between 6% and 25% of individuals with MCI progress² to dementia or Alzheimer's disease.

To avoid the catastrophic costs of dementia, all stakeholders - including physicians, providers, insurers, caregivers and family members - must be able to recognize MCI as an early stage of cognitive decline. Until now, however, cognitive tests have failed to accurately identify those with MCI or very mild dementia - a fact that leaves clinicians in the dark and puts the affected individual's independence and financial solvency at great risk.

\$174,000 = the average lifetime cost of care for Alzheimer's.

6% - 25% of MCI patients progress to dementia or Alzheimer's disease each year.



The downward trend becomes more observable as impairment increases

The EMST captures and evaluates more comprehensive information than any other cognitive testing technology.

INTRODUCING THE ENHANCED MENTAL SKILLS TEST

With the Enhanced Mental Skills Test (EMST), LifePlans introduces the latest and most advanced generation of cognitive screening. Easy to administer, the EMST can be implemented by trained staff in both controlled and community settings. The overall administration time is less than 15 minutes - minimizing the burden on all parties.

The EMST makes early detection results available almost immediately. Once reviewed with a clinician, these results can lead to the preventative treatment and frequent monitoring needed to delay progression. For individuals with MCI, this can mean an improved lifestyle and lower health care costs. For insurers, it can mean help in selecting new insurance applicants and managing potential claims costs.

SCORING "A" IN ACCURACY

The EMST captures and evaluates more comprehensive information than any other cognitive testing technology. Its unrivaled accuracy takes the guesswork out of early detection and risk selection. In fact, the EMST identifies MCI - as well as all subsequent stages of dementia - with the highest reported accuracy levels in the scientific literature. The EMST shows an overall accuracy of 97%. It's sensitivity for MCI is 94%; jumping to 98% for mild dementia and 100% for moderate and severe dementia. In addition to accurately identifying MCI, the EMST uses an algorithm to differentiate cognitive impairment from lapses in attention and concentration due to depression, cerebrovascular or subcortical disease, sleep deprivation and other disorders.

The EMST evaluates many diverse factors to maximize accuracy when detecting cognitive dysfunction.

LifePlans developed the EMST to meet the realities facing today's health care providers.

The EMST is easily implemented in-person or over the phone by trained assessors.

THE PREDICTIVE POWER OF THE EMST

The EMST tests all key domains relevant to identifying MCI. These include executive function (abstract reasoning, judgment, insight and concept organization), working and episodic memory, comprehension, attention, concentration and language. In contrast, other screening tests typically focus only on those domains associated with later stages of cognitive decline.

While other cognitive tests rely on a single cut-off score to identify who may or may not have dementia, the EMST's scoring is based on multiple factors that enhance its sensitivity and specificity in screening for the very earliest stages of cognitive decline. These include the number of words recalled during word trials, their word order, any changes in performance when recalling a word across working and episodic memory trials, and the person's insight into his/her own memory ability.

VALIDATED IN SCIENCE

The EMST is based on two scientifically accepted cognitive testing technologies. The first — the CERAD³ Wordlist — is a sub-set of the CERAD battery, widely acknowledged as the gold standard for dementia testing. The second is the original Mental Skills Test which was developed, tested and validated by Medical Care Corporation. This test is currently used in Alzheimer's centers and medical facilities in the United States and Japan.

LifePlans worked with Medical Care Corporation to refine and customize the technology for the insurance and health services environment. During an extensive pilot using community-dwelling individuals, LifePlans found that the EMST resulted in a low number of false positives - thereby improving risk selection and increasing policy placement in the insurance setting. This pilot also validated the EMST's improved sensitivity over existing tests and its ease of implementation, both over the phone and in-person.

HOW THE EMST WORKS

The EMST mimics the human memory process by focusing on the encoding and retrieval of information such as word lists. The EMST word lists are the most scientifically validated of their kind. Each list is balanced to increase the accuracy of results by avoiding uncommon words, alliteration, homonyms and associations between words. The EMST's methodology also builds in validity checks to identify the impact of anxiety, attention issues or external aides (cheating) on test results.

The EMST provides maximum insight into cognitive function through the following steps:

- *Initial Instruction* - to assess attention, comprehension and language
- *Three Immediate Word List Repetitions* - to assess executive function, attention, concentration and working memory
- *Estimation of Performance* - to assess executive function, judgment and reasoning
- *Delayed Free Recall* - to assess episodic and working memory
- *Delayed Cued Recognition* - to assess episodic memory

SENSITIVITY OF THE EMST ALGORITHM

100%	97%	94%	98%	98%	100%	100%
75%						
50%						
25%						
0%						
	Normal	MCI - All	MCI of Alzheimer's Nature	Mild Dementia	Moderate Dementia	Severe Dementia

Note: Accuracies are highest reported in scientific literature

AREAS ASSESSED

THE EMST ASSESSES ALL CRITICAL COMPONENTS TO TEST THE EARLIEST SIGNS OF MCI:

TEST COMPONENTS	AREAS ASSESSED
Instructions	Attention, Comprehension and Language
10-word Recall (3 trials)	Attention, Concentration, Working Memory, Executive Function
Estimation	Judgement and Reasoning
Triadic Comparison	Abstract Reasoning, Executive Function
Rehearsed, Delayed Recall	Episodic Memory, Working Memory
Delayed Cued Recognition	Episodic Memory
Unrehearsed, Delayed Recall	Episodic Memory, Judgement
Additional questions on exam	Progressive vs. Static Nature of Impairment

BOOST CLASSIFICATION ACCURACY AND MINIMIZE RISK

As the first comprehensive test to clearly identify the earliest precursors to cognitive decline, the EMST delivers the information required to enable rapid preventative treatment, improve risk selection and minimize health care costs. The end results? More stable insurance premiums ... more effective treatment plans ... more independence for affected individuals ... and greater financial protection for all concerned.



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¹ Ernst, RL; Hay, JW. "The U.S. Economic and Social Costs of Alzheimer's Disease Revisited." American Journal of Public Health 1994; 84(8): 1261 - 1264. This study cites figures based on 1991 data, which were updated in the journal's press release to 1994 figures. Cited in 2001 - 2002 Alzheimer's Disease Progress Report. National Institutes of Health publication number 03-5333, July 2003; p. 2.

²Peterson, et al, Neurology, 2001.

³ Consortium to Establish a Registry for Alzheimer's Disease