

# The Memory Impairment Screen more accurately screened for Alzheimer disease than the 3-word memory test in older adults

Kuslansky G, Buschke H, Katz M, Sliwinski M, Lipton RB. Screening for Alzheimer's disease: the memory impairment screen versus the conventional three-word memory test. *J Am Geriatr Soc.* 2002;50:1086-91.

## QUESTION

In community-dwelling older adults, how accurate is the Memory Impairment Screen (MIS) compared with the conventional 3-word memory test for screening for Alzheimer disease (AD)?

## DESIGN

Blinded comparison of the MIS and the 3-word memory test with a comprehensive clinical diagnostic assessment (including neurologic and neuropsychological tests) for AD.

## SETTING

A college of medicine in Bronx, New York, USA, as part of the Einstein Aging Study (EAS).

## PATIENTS

240 community-dwelling older adults who were  $\geq 70$  years of age (mean age 79 y, 64% women) and were participating in the EAS.

## DESCRIPTION OF TESTS AND DIAGNOSTIC STANDARD

The MIS is a 4-minute, 4-item delayed memory test assessing free and cued word recall. The conventional 3-word memory test is a delayed free recall memory task from the

Mini-Mental State Examination (MMSE). The MIS and 3-word memory test were given on different days by different examiners. AD was diagnosed by clinical assessment according to the criteria of the Neurological and Communicative Disorders and Stroke and the Alzheimer's Disease and Related Disorders Association.

## MAIN OUTCOME MEASURES

Sensitivity, specificity, likelihood ratios, and area under the receiver-operating characteristic (ROC) curves for the MIS and the 3-word memory test.

## MAIN RESULTS

28 of 240 (12%) community-dwelling older adults were diagnosed with AD. The sensitivity, specificity, and likelihood ratios for the

MIS and the 3-word memory test are in the Table. The area under the ROC curves was 0.93 for the MIS and 0.80 for the 3-word memory test.

## CONCLUSION

In community-dwelling older adults, the Memory Impairment Screen more accurately screened for Alzheimer disease than did the conventional 3-word memory test.

*Sources of funding: National Institute on Aging and National Institute of Child Health and Human Development.*

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### Diagnostic characteristics of the Memory Impairment Screen (MIS) and the conventional 3-word memory test for Alzheimer disease screening in community-dwelling older adults\*

Tests	Sensitivity (95% CI)	Specificity (CI)	+LR	-LR
MIS score $\leq 4$	86% (68 to 95)	97% (93 to 98)	28.7	0.14
3-word memory test score $< 1$	65% (45 to 80)	85% (79 to 89)	4.33	0.41

\*Diagnostic terms defined in Glossary; CIs provided by author, and LRs calculated from data in article.

## COMMENTARY

Kuslansky and colleagues report that the short MIS test comprising free and cued recall of 4 items is more reliable than the 3-item recall of the MMSE. This is important because the 3-item recall of the MMSE may be the most accurate component of this test when screening for AD.

These tests of short-term memory avoid the effects of education that affect interpretation of the whole MMSE. The effect of education on MMSE scores seriously limits the use of the MMSE as a screening test for dementia in the general population: The median score on the MMSE is 29 for persons with  $\geq 9$  years of education and 22 for those with  $< 4$  years of education (1). This difference occurs because parts of the MMSE require reading and writing. Short tests of recall such as the MIS may avoid the effects of education on test scores because education is unlikely to affect short-term memory.

The use of such short recall screening tests as the MIS requires minimal training, which increases their applicability. Such tests are easy to use and available to a broad range of health care personnel who work in

this field to determine if patients need further assessment. The MIS, taking only 4 minutes, is easier to use than the MMSE, which can take up to 20 minutes.

It is not clear if the MIS can stage dementia, and it is unlikely that the MIS can discriminate between different types of dementia. Future studies might assess whether the MIS can distinguish mild cognitive impairment from normal age-related cognitive changes.

The MIS short test offers clinicians another quick screen for AD that has potentially wide clinical utility and applicability.

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## Reference

1. Crum RM, Anthony JC, Bassett SS, Folstein MF. Population-based norms for the Mini-Mental State Examination by age and educational level. *JAMA.* 1993;269:2386-91.