

Cochrane for Clinicians

Putting Evidence into Practice

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This series is coordinated by Corey D. Fogleman, MD, Assistant Medical Editor.

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Mini-Mental State Examination for the Detection of Dementia in Older Patients

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Clinical Question

Is the Mini-Mental State Examination (MMSE) useful in detecting dementia in clinically unevaluated patients 65 years and older?

Evidence-Based Answer

When scores are adjusted based on a patient's education level, the MMSE may be useful to rule out a diagnosis of dementia in clinically unevaluated patients 65 years and older (sensitivity = 97%; specificity = 70%). Scores of less than 24 may also be useful to rule in dementia in patients 65 years and older (sensitivity = 85%; specificity = 90%). These patients warrant further evaluation. There is insufficient evidence to recommend a specific score on the MMSE to confidently rule out or rule in dementia in patients 65 years and older.¹ (Strength of Recommendation: B, based on inconsistent or limited-quality patient-oriented evidence.)

Practice Pointers

Although the estimated prevalence of dementia ranges from 5% to 37% in U.S. adults older than 70 years, as many as 29% to 76% may go undiagnosed by their primary care physicians.² The MMSE is a 30-point scale, with lower numbers equating to more severe impairment. It was originally used to characterize the severity of cognitive impairment and to monitor that severity over time.³ However, the MMSE and similar tests of cognition are also used in primary care as part of the initial evaluation of patients with suspected dementia.⁴

This Cochrane review is a meta-analysis of 28 community-based studies with 12,110 patients and six primary care studies with 1,681 patients.¹ Community-based studies

conducted mass screening of asymptomatic persons in a public-health format. All the patients in the studies were 65 years and older.

In the community-based studies, a score of less than 24 on the MMSE was 85% sensitive (95% confidence interval [CI], 74% to 92%) and 90% specific (95% CI, 82% to 95%) for dementia. Adjusting the score for education level yielded a higher sensitivity of 97% (95% CI, 83% to 100%) but a lower specificity of 70% (95% CI, 50% to 85%). When screening 1,000 asymptomatic persons, of whom 140 have dementia, and using a cutoff adjusted for education level, four persons with dementia would be missed and 258 would be subjected to further testing. If an unadjusted score of less than 24 were used in the same population, 21 persons with dementia would be missed, but 86 would be subjected to further testing.

The MMSE is one of a number of available tests to evaluate cognitive performance as part of a dementia evaluation.⁴ The Montreal Cognitive Assessment tool (MoCA) is also a one-page, 30-point scale that is gaining favor over the MMSE because of its greater sensitivity for mild cognitive impairment with less educational, language, and cultural bias.⁵ The MoCA is not copyrighted, whereas use of the MMSE is copyright restricted. The *Diagnostic and Statistical Manual of Mental Disorders*, 5th ed., suggests formal neuropsychological testing when available, allowing for less extensive testing if formal testing is not available, without providing a recommendation on any specific cognitive assessment tools.⁶ A formal diagnosis of dementia requires that cognitive performance be interpreted in the context of the patient's current condition, including symptomatology, progression, impact on daily living, and a search for other causes (e.g., delirium, depression, medication effect).⁴

The U.S. Preventive Services Task Force found insufficient evidence to recommend for or against screening based on the lack of evidence for improved decision making by

the patient, family, or caregiver, and societal outcomes were not improved with earlier detection.² Despite this recommendation, the Medicare annual wellness visit requires cognitive screening, but it does not provide specific guidance on the appropriate evaluation of patients who screen positive. The Medicare Detection of Cognitive Impairment Workgroup, convened by the Alzheimer's Association, recommends a stepwise approach in which one or more cognitive assessment tools, such as the MMSE, are a step or component in the evaluation.⁷ This Cochrane review supports the conclusion that the MMSE may be useful to help screen for dementia, but it should not be used in isolation to diagnose the disease.¹

The practice recommendations in this activity are available at <http://summaries.cochrane.org/CD011145>.

EDITOR'S NOTE: The MMSE had been freely available and widely disseminated after first being released in 1975. However, starting in 2000, its authors (Dr. Folstein and others) began enforcing their copyright, and in 2001 arranged for Psychological Assessment Resources (PAR) to manage worldwide rights. PAR insists that all users register with their site, complete a four-page permissions request form, and pay a fee for each MMSE form and its use (approximately \$1.35), as well as purchase a test manual (\$78) [Costs as of October 2016]. <http://www4.parinc.com/ProRes/permissions.aspx>.

This commercialization of a cognitive screening test seems antithetical to the advancement of science and the practice of medicine. Until the MMSE's copyright holders abandon this practice, clinicians should know that there are alternatives to the MMSE, including the Saint Louis University Mental Status (SLUMS) examination, which has been shown to be more sensitive than the MMSE: <http://aging.slu.edu/index.php?page=saint-louis-university-mental-status-slums-exam>.

The views expressed herein are those of the authors and do not reflect the official policy of the Department of the Army/Navy/Air Force, the Department of Defense, or the U.S. government.

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Impact of Exercise-Based Cardiac Rehabilitation

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Clinical Question

Does exercise-based cardiac rehabilitation in persons with coronary heart disease affect morbidity and mortality?

Evidence-Based Answer

Exercise-based cardiac rehabilitation reduces cardiovascular mortality and hospitalization. There is no evidence that it reduces the rates of total mortality, myocardial infarctions, coronary artery bypass grafts, or percutaneous coronary interventions.¹ (Strength of Recommendation: B, based on lower-quality clinical trials or studies with inconsistent findings.)

Practice Pointers

Although modern medical and surgical management allows patients with coronary heart disease to live longer than ever before, cardiovascular disease remains the leading cause of death in the United States.² Exercise-based cardiac rehabilitation has been suggested as a modality to reduce morbidity and mortality in this growing population. The authors of this review sought to evaluate the effect of exercise-based cardiac rehabilitation on

morbidity and mortality in patients with cardiovascular disease.¹

This Cochrane review identified 63 randomized controlled trials comparing exercise-based cardiac rehabilitation with usual care (e.g., education, medical management) in 14,486 patients with coronary heart disease.¹ Most participants had experienced a myocardial infarction and/or a revascularization procedure, and the mean ages of patients across studies ranged from 48 to 71 years. The quality of the trials ranged from low to moderate, with a lack of adequate reporting on methodology in many trials. Exercise-based cardiac rehabilitation reduced cardiovascular mortality (number needed to treat [NNT] = 36; 95% confidence interval [CI], 27 to 64) and overall risk of hospital admissions (NNT = 22; 95% CI, 11 to 81) compared with control. There was no reduction in the rate of myocardial infarctions, total mortality, coronary artery bypass grafts, or percutaneous coronary interventions.

The authors did not pool the data for health-related quality of life. They found that 14 of 20 studies reported improvement in one or more of the subscales assessing this outcome (e.g., physical functioning and performance, general health, pain), but the results were inconsistent across studies. Four studies reviewed the cost-effectiveness of exercise-based cardiac rehabilitation. Estimates ranged from a cost savings of \$650 to an expenditure of \$42,535 to gain one quality-adjusted life year.

Current American, Canadian, and European guidelines encourage cardiac

rehabilitation with an exercise component for secondary prevention as part of a multifaceted strategy for patients with coronary heart disease.^{3,4} This review provides further evidence that cardiac rehabilitation offers significant patient benefit.

The practice recommendations in this activity are available at <http://summaries.cochrane.org/CD001800>.

EDITOR'S NOTE: The numbers needed to treat reported in this Cochrane for Clinicians were calculated by AFP medical editors based on raw data provided in the original Cochrane review.

The views expressed herein do not necessarily reflect the views of the Uniformed Services University of the Health Sciences, the U.S. Army, or the Department of Defense.

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