

Mini-Mental State Examination (MMSE)

Description

The Mini-Mental State Exam (MMSE) is a brief test of cognitive impairment used widely to screen for dementia. The original test, developed by Folstein et al (1975), includes questions about orientation, attention, recall, and language. Galasko et al (1990) developed a shorter version of the test (Modified MMSE) that is as sensitive as the complete test.

Target population(s)	Time taken	Cost	Special training required
People at risk of dementia	5–15 minutes	Nil	No

Instructions to the client The test is scored by an assessor who questions the client. Questions include those relating to orientation to place, attention, calculation, and recall.

Example: Spell 'world' backwards. (Answer: DLROW.) Subtract 7 from 100, then repeat from result etc. Stop after 5. (Answer: 100, 93, 86, 79, 65.)

Method of scoring Each question is scored out of 5 except for the recall question, which is scored out of 3. The recommendation for the modified scale is to add only the scores for recall and orientation for place to give a total out of 8.

Sensitivity/specificity A score of 23 out of a possible 30 is recommended as the cut-off score for dementia (Folstein et al 1975). In a cross-sectional study, the test distinguished 74 clients with early Alzheimer's disease from 74 healthy subjects matched for age and education levels (Galasko et al 1990). Sensitivity was 0.69 and specificity 0.82 (Kuslansky et al 2004). A score of less than 3 out of 8 on the Modified MMSE is considered to be at least as specific as the original MMSE in detecting early Alzheimer's disease (Galasko et al 1990).

Reliability Inter-rater reliability was found to be high (mean kappa value 0.97) in clients attending general practice in Britain (n = 2302, O'Connor et al 1989). Test-retest reliability has been examined over a 1 year period in healthy community-dwelling elderly people. Correlation coefficients ranged between 0.45 and 0.5 (n = 122, Mitrushina & Satz 1991).

Validity The predictive validity of the MMSE as a screening test for dementia depends on educational level (Schmand et al 1995).

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Commentary

The MMSE is the almost universally accepted screening tool for cognitive impairment. While it is most useful for detecting dementia, low scores may be due to a number of conditions including delirium and depression. It is useful across a range of physiotherapy settings including ambulatory, home, and inpatient settings. A score below 24 requires further evaluation including informant history and more detailed cognitive assessment; this usually requires the input of an appropriate medical specialist and/or a neuropsychologist. These services can be found in a memory clinic or other practice settings. For clients who have had any secondary education a score below 26 should be similarly further evaluated. The test is very sensitive to education (Tombaugh et al 1992, Tanglos et al 1996), age, and cultural background; for instance a score of 20 may be normal for a 90 year old who had limited schooling. The test does not deliver 100% sensitivity so a score of 28 may be obtained in a well-educated person with other features and an eventual diagnosis of dementia. Also, it is important to be aware that 'WORLD' backwards and 'Serial 7' are not equivalent. Folstein intended 'Serial 7' to be offered to all except those who were innumerate. Whichever is used, the same should be used in subsequent tests to detect change.

Cognitive impairment is unreliably detected by interaction

with the client, so a policy of routine screening using a tool such as the MMSE should be considered, especially with higher risk groups such as older inpatients. Interest in detection of cognitive impairment has undoubtedly been increased by the current availability of specific dementia pharmaceutical therapies (e.g. drugs with trade names such as Aricept, Exelon, Reminyl and Ebixa) and anyone who screens positive on the MMSE should be considered for further evaluation so they are not denied these therapies. While the MMSE was not designed to monitor change, it is sensitive to this; a change of 5 points is likely to be clinically significant.

What are the implications for physiotherapists of a low MMSE score in clients? Apart from initiating further assessment, the therapist needs to be aware that clients may need repeated instruction and that they may adhere poorly to appropriate precautions. They may also have non-memory impairments, such as reduced planning or visuospatial impairments, affecting movement and more complex activities. Reduced language skills may also affect comprehension and expression.

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References

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