

Standardized Mini-Mental State Examination (SMMSE)

Guidelines for administration
and scoring instructions



Standardized Mini-Mental State Examination (SMMSE) – Guidelines for administration and scoring instructions

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The SMMSE consists of the Guidelines for Administration and Scoring Instructions booklet (this booklet), and a separate SMMSE tool. The Guidelines for Administration and Scoring Instructions booklet offers comprehensive instructions that accompany the SMMSE tool, and both materials should always be used in conjunction. The SMMSE materials are available for download on the Seniors Care Network website at

seniorscarenetwork.ca/resources/patientclientcaregiver-resources/

For questions regarding the use of the SMMSE, please contact Seniors Care Network at info@seniorscarenetwork.ca



Standardised Mini-Mental State Examination (SMMSE)

Introduction

The population is aging. Elderly frail adults are the most rapidly growing group in developed countries. More and more physicians are coming to recognise the importance of cognitive testing in the assessment of older adults. About 10% of people aged 70 or more and a third of those aged 85 and over have dementia. Yet this is often missed, particularly in the early stages.

The “mini-mental” is the most widely used screening test of mental function in this age group. This short booklet describes a standardised version of this test and shows how physicians and other health care professionals can use and interpret it. This short booklet describes some uses that they may not be aware of previously.

Since Dr. Marshall Folstein first developed the Mini-Mental State Examination (MMSE) in 1975, it has become widely used as a screening test for cognitive impairment and it is routinely used as an inclusion/exclusion criterion and outcome measure in clinical trials. The test covers a variety of cognitive domains, including orientation to time and place, short and long term memory, registration, recall, constructional ability, language and the ability to understand and follow commands. This test should never be used alone. It is used in conjunction with a corroborative history.

The test usually takes about ten minutes to complete

and can be used reliably after a short training period by physicians, nurses and other healthcare professionals. The original MMSE had few instructions for administration and scoring. These were left to the discretion of each rater. Different raters developed their own unique styles and techniques of administration and scoring. This led to wide differences and lowered the reliability of the test.

The Standardised Mini-Mental State Examination was developed to provide clear unequivocal guidelines for administration and scoring. The SMMSE takes less time to administer and has significantly reduced the variability of the MMSE.^{1,2}

The intrarater variability is significantly lower with the SMMSE (86%, $P < 0.003$) and the inter-rater variance was reduced by 76%, compared to the MMSE. Intraclass correlation for the MMSE was 0.69 compared to 0.90 for the SMMSE. The mean duration of assessments was 13.4 minutes for the MMSE, compared to 10.5 minutes for the SMMSE ($p < 0.004$).¹

The instructions for administration and scoring the SMMSE are short and cryptic. Some further background, discussion and explanation of these rules and guidelines may be useful.

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References:

1. Molloy et al. Reliability of a standardised Mini-Mental State Examination compared with the traditional Mini-Mental state Examination. *American Journal of Psychiatry*, Vol. 14, 1991a, pp.102-105. 2. Molloy et al. Standardized Mini-Mental State Examination, A User's Guide. 1999.

DIRECTIONS FOR ADMINISTRATION OF THE SMMSE

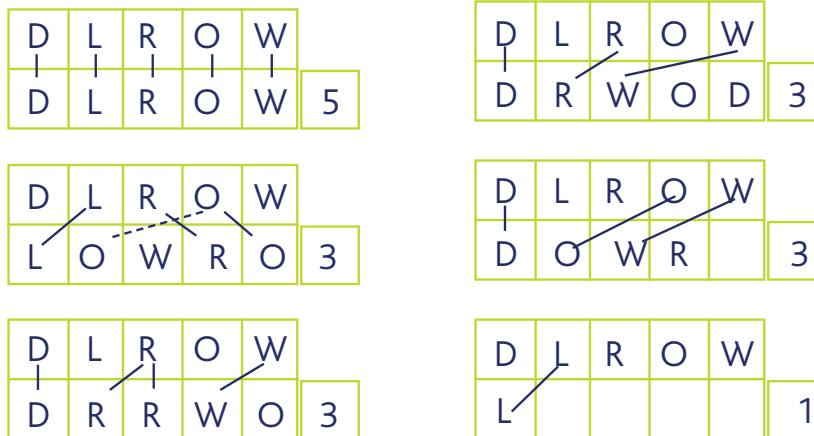
1. Before the questionnaire is administered, try to get the person to sit down facing you. Assess the person's ability to hear and understand very simple conversation, e.g. What is your name? If the person uses hearing or visual aids, provide these before starting.
2. Introduce yourself and try to get the person's confidence. Before you begin, get the person's permission to ask questions, e.g. Would it be all right to ask you some questions about your memory? This helps to avoid catastrophic reactions.
3. Ask each question a maximum of three times. If the subject does not respond, score 0.
4. If the person answers incorrectly, score 0. Accept that answer and do not ask the question again, hint, or provide any physical clues such as head shaking, etc.
5. The following equipment is required to administer the instrument: A watch, a pencil, reverse of the SMMSE score sheet with CLOSE YOUR EYES written in large letters and two fivesided figures intersecting to make a four-sided figure, and a space for the person to write down a sentence.
6. If the person answers, What did you say?, do not explain or engage in conversation, merely repeat. Merely repeat the same directions a maximum of three times.
7. If the person interrupts (e.g. What is this for?), just reply: I will explain in a few minutes, when we are finished. Now if we could proceed please... we are almost finished.

Scoring Guidelines

Scoring WORLD backwards (Question 4)

This task accounts for 17% of the total score. It's essential to score it reliably. There are many different ways and "systems" for scoring WORLD backwards. Originally, Dr. Folstein advised that the score is "the number of letters in the correct order." The authors suggest the following method. Score ORDER not SEQUENCE. Simply write down the correct response: D L R O W. Now place the last five letters the subject said below. Now draw lines between the same letters on the response given and DLROW. These lines MAY NOT CROSS. The person's score is the maximum number of lines that can be drawn, without crossing any.

In SMMSE there are many different ways to score this task, but we have found this method to be simple, reliable and easy to apply.



Example to show differences between MMSE and SMMSE scoring

D	L	R	O	W
D	R	L	W	O

MMSE scores order: 1

SMMSE scores sequence: 3

Scoring examples of WORLD spelled backwards

	D	L	R	O	W	Score
D	D					1
DL	D	L				2
DLD	D	L				2
DLDR	D	L	R			3
DLLOR	D	L		O		3
DLLRW	D	L	R		W	4
DLLW	D	L			W	3
DLO	D	L		O		3
DLOD	D	L		O		3
DLODR	D	L		O		3
DLOL	D	L		O		3
DLOLD	D	L		O		3
DLOLW	D	L		O	W	4
DLOR	D	L		O		3
DLORD	D	L		O		3
DLORL	D	L		O		3
DLORW	D	L		O	W	4
DLOW	D	L		O	W	4
DLOWD	D	L		O	W	4
DLOWR	D	L		O	W	4
DLR	D	L	R			3
DLRLD	D	L	R			3
DLRLO	D	L	R	O		4
DLRLW	D	L	R		W	4
DLRO	D	L	R	O		4
DLROD	D	L	R	O		4
DLROL	D	L	R	O		4
DLROO	D	L	R	O		4
DLRRD	D	L	R			3
DLRW	D	L	R		W	4
DLW	D	L			W	3
DLWO	D	L			W	3
DLWOR	D	L			W	3
DLWRO	D	L	R	O		4
DO	D			O		2

DOL	D			O		2
DOLD	D			O		2
DOLOW	D			O	W	3
DOLRD	D	L	R			3
DOLRW	D	L	R		W	4
DOLW	D			O	W	3
DOLWR	D			O	W	3
DOR	D			O		2
DORL	D			O		2
DORLD	D			O		2
DORLW	D			O	W	3
DOROL	D		R	O		3
DOROW	D		R	O	W	4
DORW	D			O	W	3
DORWD	D			O	W	3
DORWR	D			O	W	3
DOW	D			O	W	3
DOWLD	D			O	W	3
DOWLW	D			O	W	3
DOWR	D			O	W	3
DOWRL	D			O	W	3
DOWRW	D			O	W	3
DR	D		R			2
DRL	D		R			2
DRLD	D		R			2
DRLO	D		R	O		3
DRLOW	D		R	O	W	4
DRLW	D		R		W	3
DRLWO	D		R		W	3
DRO	D		R	O		3
DROLW	D		R	O	W	4
DROR	D		R	O		3
DROW	D		R	O	W	4
DROWL	D		R	O	W	4
DRW	D		R		W	3
DRWLD	D		R		W	3
DW	D				W	2

DWL	D				W	2
DWLR	D	L	R			3
DWLRO	D	L	R	O		4
DWOLD	D				W	2
DWORD	D				W	2
DWORL	D				W	2
DWROR	D		R	O		3
LD		L				1
LDO		L		O		2
LDORL		L		O		2
LDORW		L	R		W	3
LDOWR		L		O	W	3
LDROW		L	R	O	W	4
LDRWO		L	R		W	3
LDWO		L			W	2
LLRD		L	R			2
LODLO		L		O		2
LORD		L		O		2
LORDW		L		O	W	3
LORL		L		O		2
LORW		L		O	W	3
LOW		L		O	W	3
LOWL		L		O	W	3
LRO		L	R	O		3
LROR		L	R	O		3
LROW		L	R	O	W	4
LWROW		L	R	O	W	4
ODLWR	D	L			W	3
OLD				O		1
OLDW				O	W	2
OLWRD				O	W	2
RDLOW	D	L		O	W	4
RDOLD			R	O		2
RO			R	O		2
W					W	1
WDLRO	D	L	R	O		4
WOLD					W	1

WOLDW				O	W	2
WOR					W	1
WORLD					W	1
WRL					W	1
WRLD					W	1
WORLD					W	1

Scoring of Serial Sevens (Alternative to Question 4)

The serial sevens task is presented as an alternative to spelling "World" backwards. The two tasks are not equivalent. The serial sevens is an easier task, and the scoring is easier. It can be used as an alternate to spelling WORLD backwards in people who are illiterate.

Say: Subtract 7 from 100 and keep subtracting 7 from what's left (write down subject's reply).

Once subject starts – do not interrupt – allow him/her to proceed until five subtractions have been made. If subject stops before five subtractions have been made, repeat the original instruction keep subtracting seven from what's left (maximum 3 times).

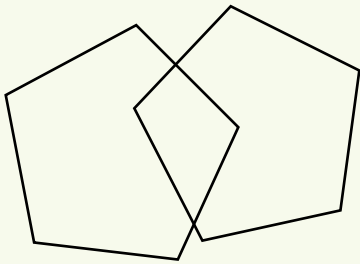
Score as follows:

93, 86, 79, 72, 65 ✓ ✓ ✓ ✓ ✓	5 points (all correct)
93, 88, 81, 74, 67 ✓ X ✓ ✓ ✓	4 points (4 correct, 1 wrong)
92, 85, 78, 71, 64 X ✓ ✓ ✓ ✓	4 points (4 correct, 1 wrong)
93, 87, 80, 73, 64 ✓ X ✓ ✓ X	3 points (3 correct, 2 wrong)
92, 85, 78, 71, 63 X ✓ ✓ ✓ X	3 points (3 correct, 2 wrong)
93, 87, 80, 75, 67 ✓ X ✓ X X	2 points (2 correct, 3 wrong)
93, 87, 81, 75, 69 ✓ X X X X	1 point (1 correct, 4 wrong)

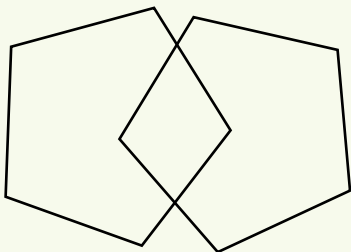
Scoring the Overlapping Pentagons (Question 11)

Give the subject the pencil, with the eraser, and a clean piece of paper. Examples are provided to score this task. Many older adults draw shaky, wiggly lines with unclear angles that are more curved than straight. These are acceptable, as long as the person has two five-sided figures intersecting to form a four-sided figure.

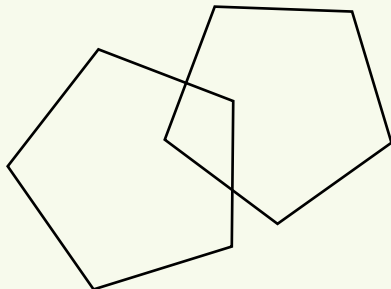
Correct



Score 1

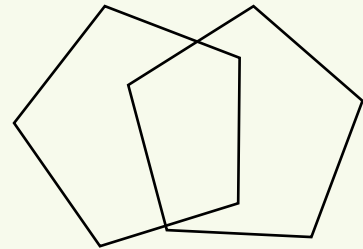


Score 1

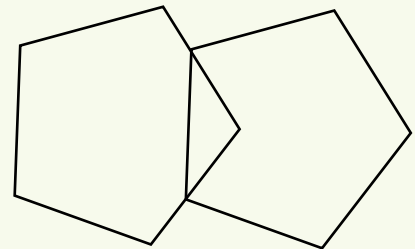


Score 1

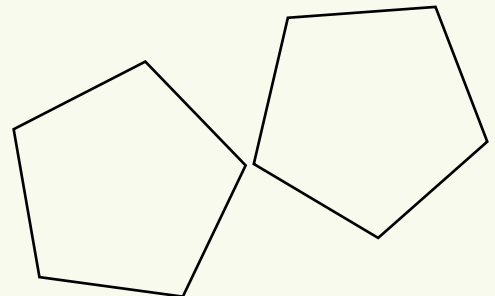
Incorrect



Score 0



Score 0



Score 0

Time:

Adjusting Scores

It is important to score the test as fairly as possible for everyone. People who have physical, non-cognitive disabilities should not score lower just because they are physically unable to perform certain tasks. For example, an arm amputee obviously cannot “fold the paper in half once with both hands” as item 20 directs. Modify the test by asking the subject to take the paper in his or her hand, crumple it up and throw it on the floor. If the test cannot be modified, then omit the task. If an item has been omitted because of physical disability, it is important to take this into account when scoring the test. The score from this task is subtracted from the total score (30) to give a new total. The person’s score is then adjusted to this new total score.

Here is the formula for calculating adjusted scores:

Formula	Actual Score	X30	Maximum Obtainable Score
Explanation	Add up the score on all the items that the person was physically able to do.	Multiply the actual score by 30	The total points of all the items that a person can physically do is the maximum obtainable score. Take the number from the previous box and divide it by the maximum obtainable score to get the final SMMSE score.
Example	A blind person cannot read “Close Your Eyes”, write a sentence or copy the two five-sided figures. These items (17, 18 and 19) are omitted. The maximum score of these three items is 3 points.		
Process	Person’s total score on test is: 15	Multiply by: 30	Person could not do items 17, 18 or 19. Maximum obtainable score on these items is 3. Subtract 3 from 30 = 27. Divide by this number. 27
Calculation	$(15 \times 30) / 27 = 16.66$ Final SMMSE score (after rounding) is 17		

Note: SMMSE scores are provided in whole numbers, so fractions are rounded off in the conventional manner. For 0.5 or greater, round up to the next higher whole number. For 0.49, or lower, round down to the next lower whole number.

The following are examples of disabilities that may exempt people from certain tasks in the SMMSE.

Physical disabilities:

The disability should be permanent. Sometimes people have temporary physical problems that effect SMMSE performance. In these cases, let the problem resolve before testing them. Some physical problems may take months to resolve and it may not be practical to wait. In these cases, carefully document the situation and proceed. Examples of physical disabilities include: amputation, chronic deformity from arthritis, paralysis of limbs, blindness/poor vision even with glasses, permanent hearing loss even with functioning hearing aid.

Language:

Sometimes language difficulties impair a person’s ability to perform certain tasks on the SMMSE. If English is not the subject’s first language, try to score the person in his or her first language. It can be difficult to decide when to exempt a person from certain tasks. One approach is to try as many of the tasks as possible to evaluate the person’s performance. If the subject seems to understand some questions easily and others not, this is likely due to cognitive impairment. If the person has consistent problems understanding the questions, it is likely due to language difficulties and the score can be adjusted accordingly. If in doubt, get a translator or give the test in his or her native language. Make sure you are not missing hearing impairment.

Speech:

Some people have severe speech problems, so their scores are out of proportion to their overall level of function. They score lower because they cannot answer within the prescribed time limits. Some may reverse words and may say "Winter" when they mean "Summer". These deficits unfortunately bias the test against these people. It is important to be consistent and adhere to the rules of administration, observing the time limits and scoring guidelines. Note can be made of these factors and performance in non-cognitive tests, like ADL function, should be assessed.

Education:

Low education or education in a language other than English can affect scores. Generally, these limitations should not exempt a person from some of the SMMSE tasks. Note should be made that these factors may cause lower scores and the final total may not reflect the person's true cognitive function. The person's disability should be clearly noted on the SMMSE score sheet. Items that are affected by this disability should also be clearly noted. The calculation of the adjusted score is done at the bottom of the SMMSE score sheet.

SMMSE Total Scores and Disease Progression

SMMSE Scores, Stages of Disease and Areas of Impairment in Alzheimer's Disease

Area of Functional Impairment

SMMSE Scores	30 - 25	24 - 21	21 - 10	9 - 0
Stage	May be Normal	Mild/Early	Moderate	Severe
ADL		problems with driving, finances, shopping	assistance with dressing, grooming, toileting	problems with eating, walking
Communication		word-finding, repeating, goes off topic, loses track	sentence fragments, "empty" speech, vague terms (i.e. this, that)	speech disturbances (i.e. slurring, stuttering)
Memory	subjective problems with names or misplacing objects	three item recall orientation (time then place)	WORLD spelling, language and 3 step command	all areas show obvious deficits
	Years	2-4 years	2-3 years	2-3 years

These are general guidelines to the progression of the disease. There is much individual variability.

