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Literature Review On Different Scales For Dementia

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ABSTRACT

Dementia is a progressive neurodegenerative disorder that significantly impacts cognitive functions, behavior, and daily living activities. Its multifaceted nature necessitates the use of standardized assessment tools to evaluate its severity and progression. This article explores the various scales used for assessing dementia, focusing on their clinical relevance and application in different contexts. Finally, underscoring the importance of continued efforts in advancing dementia care and improving quality of life for affected individuals.

INTRODUCTION:

Imagine the human mind as a magnificent, intricately woven tapestry, its threads representing countless experiences, emotions, and knowledge accumulated over a lifetime. This tapestry is vibrant and detailed, with each thread contributing to the rich and colorful pattern that forms the essence of our identity. As we traverse the landscapes of life, this tapestry evolves, adapting and expanding with every new moment and memory.

Dementia is akin to an intricate dance that disrupts this once-flourishing tapestry. It is not a single, uniform condition but a spectrum of disorders that gradually unravel the fabric of cognitive function, leaving behind a trail of confusion and disarray. The once-brilliant tapestry begins to fray and lose its vibrancy, as threads of memory, reasoning and understanding become tangled and disoriented.

Dementia is defined as disorder characterized by the presence of at least two of the following: Impairment in learning and retaining new or recently acquired information (impairment in episodic declarative memory), Impairment in handling complex tasks and reasoning abilities (impairment in executive cognitive functions), impaired visuospatial ability and geographic orientation, Impaired language functions.[1] The most common causes of Dementia were Alzheimer's disease, Vascular dementia, Mixed vascular and Alzheimer's dementia, Other illnesses that account for approximately 10% (Pick's disease, Lewy body dementia, Huntington's disease, Parkinson's disease, Normal pressure hydrocephalus (NPH), Alcoholic dementia, Infectious dementia, such as HIV or syphilis.

Medical scales allow doctors to make diagnoses and assess the progress of their treatment plans. It also gives insights into the medicine dosage determination and nutritional status. The precise data provided by medical scales allows experts to make the most informed decisions about patient care.

Screening scales lack the breadth of assessments and are therefore to be used only in settings in which time or frailty make longer assessment impossible. The diagnosis of dementia is always based on a clear history and invariably involves collateral history from an informant along with direct patient assessment. The purpose of an assessment scale is to increase the precision of a decision by reducing subjectivity and increasing objectivity. These assessment scales helps to distinguish impairment due to dementia from normal age-related cognitive change or to monitor the effects of treatment of dementia in a clinic or controlled trial. These scales are used to reduce uncertainty in decision making, for example in screening for cognitive impairment, making diagnoses of dementia and monitoring change. Unfortunately, we are restricting the usage of these scales for research purposes but not including them in our day to day practice. Each and every scale has limitations. So a thorough knowledge of all scales is necessary for physician to select the correct one.

For the assessment of this complex disease, we need to know about different scales which helps in diagnosing and evaluating the patient under treatment.

Key Words: Dementia, Cognition, Visual, Spatial, Alzheimer's disease

ASSESSMENT SCALES FOR DEMENTIA

Assessment scales are classified based on 7 criteria

1. Cognition
2. Function
3. Behavior
4. Quality of life
5. Depression
6. Carer burden
7. Overall dementia severity

1. Cognition - Used for screening dementia [2]

1. Mini Mental State Examination [MMSE]
2. Abbreviated Mental Test Score [AMTS]
3. Clock drawing test
4. 6 CIT
5. General Practitioner Assessment of Cognition [GPCOG]
6. Mini - cog
7. Test Your Memory [TYM]
8. Montreal Cognitive Assessment [MoCA]
9. Addenbrooker Cognitive Assessment Revised [ACE-R]
10. Memory Impairment Screen [MIS]
11. The Alzheimer's Disease Assessment Scale - Cognitive Section [ADAS-cog]

2. **Function** [2]

1. Bristol activities of daily living scale
2. Barthel Index
3. The functional independence measure
4. Instrumental activities of daily living
5. The informant questionnaire on cognitive decline in elderly [IQCODE]

3. **Behavior** [2]

1. Neuropsychiatric inventory
2. Cohen Mansfield Agitation Inventory
3. Behavioral Pathology in Alzheimer's Disease Rating Scale [BEHAVE-AD]

4. **Quality of life** [2]

1. Generic measures of quality of life
2. Short form - 36

5. **Depression** [2]

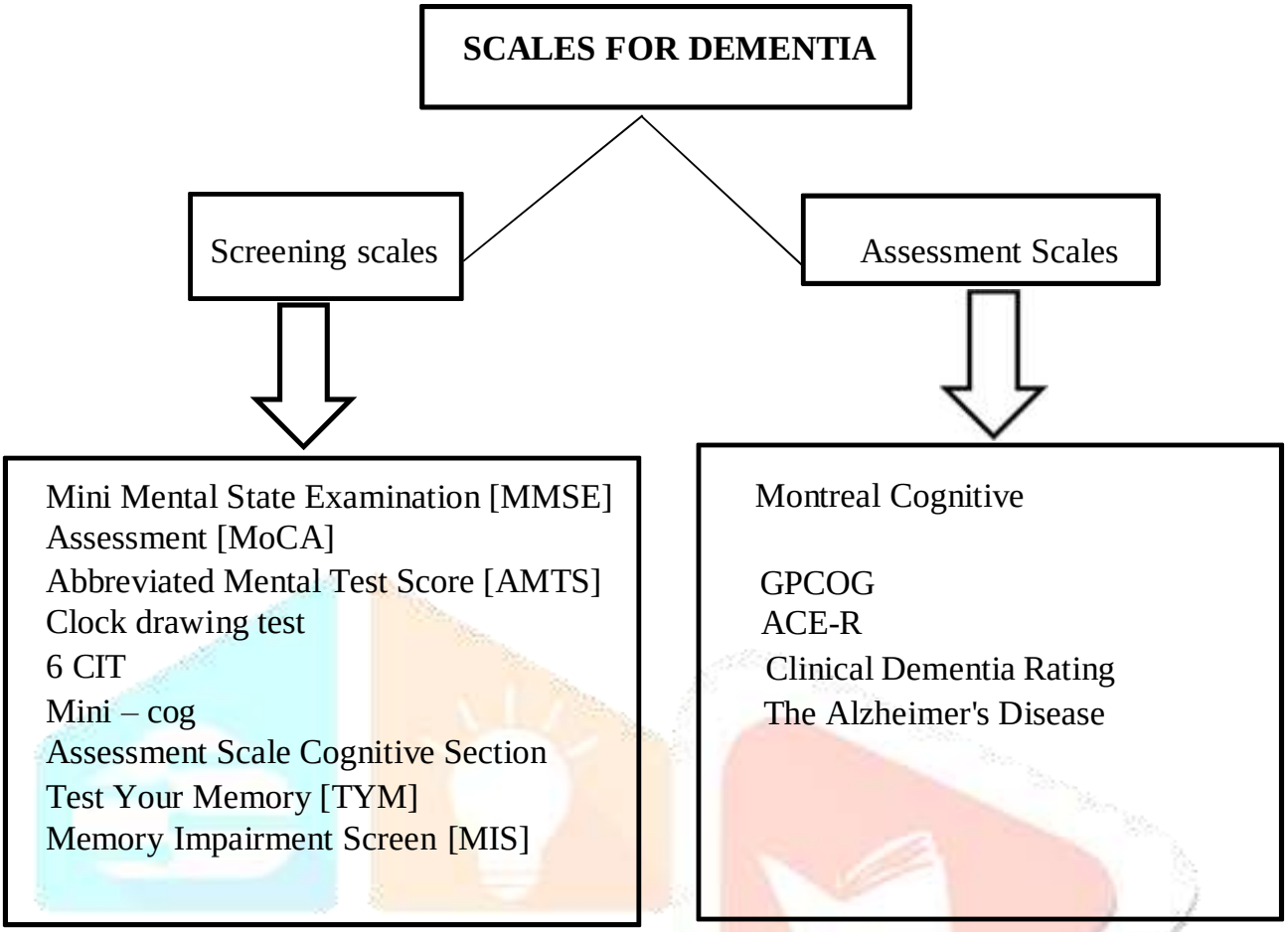
1. The geriatric depression scale
2. Cornell scale for depression in dementia
3. The Montgomery asberg depression rating scale
4. The Hamilton depression rating scale
5. The hospital anxiety and depression scale

6. **Carer burden** [2]

1. General health questionnaire
2. Zarit burden interview

7. **Overall dementia severity** [2]

1. Clinical Dementia Rating
2. Global Deterioration Scale
3. Clinician's Global Impression of change



MINI MENTAL STATE EXAMINATION [MMSE]

It is a set of 11 questions. It is used to check for cognitive impairment. The test takes about 5 to 10 minutes. [3]

It checks 6 areas of mental ability. These includes: [3]

1. Knowing where you are - the date and place
2. Attention and concentration
3. Short-term memory (recall)
4. Language skills
5. Visual and spatial relationships between objects
6. Ability to understand and follow instructions

Patient's Name: _____ Date: _____

Instructions: Score one point for each correct response within each question or activity.

Maximum Score	Patient's Score	Questions
5		"What is the year? Season? Date? Day? Month?"
5		"Where are we now? State? County? Town/city? Hospital? Floor?"
3		The examiner names three unrelated objects clearly and slowly, then the instructor asks the patient to name all three of them. The patient's response is used for scoring. The examiner repeats them until patient learns all of them, if possible.
5		"I would like you to count backward from 100 by sevens." (93, 86, 79, 72, 65, ...) Alternative: "Spell WORLD backwards." (D-L-R-O-W)
3		"Earlier I told you the names of three things. Can you tell me what those were?"
2		Show the patient two simple objects, such as a wristwatch and a pencil, and ask the patient to name them.
1		"Repeat the phrase: 'No ifs, ands, or buts.'"
3		"Take the paper in your right hand, fold it in half, and put it on the floor." (The examiner gives the patient a piece of blank paper.)
1		"Please read this and do what it says." (Written instruction is "Close your eyes.")
1		"Make up and write a sentence about anything." (This sentence must contain a noun and a verb.)
1		"Please copy this picture." (The examiner gives the patient a blank piece of paper and asks him/her to draw the symbol below. All 10 angles must be present and two must intersect.) 
30		TOTAL

Score

The Mini-mental state examination is scored on a scale of 0-30 with scores > 25 interpreted as normal cognitive status.

- Severe cognitive impairment: 0-17
- Mild cognitive impairment: 18-23
- No cognitive impairment: 24-30

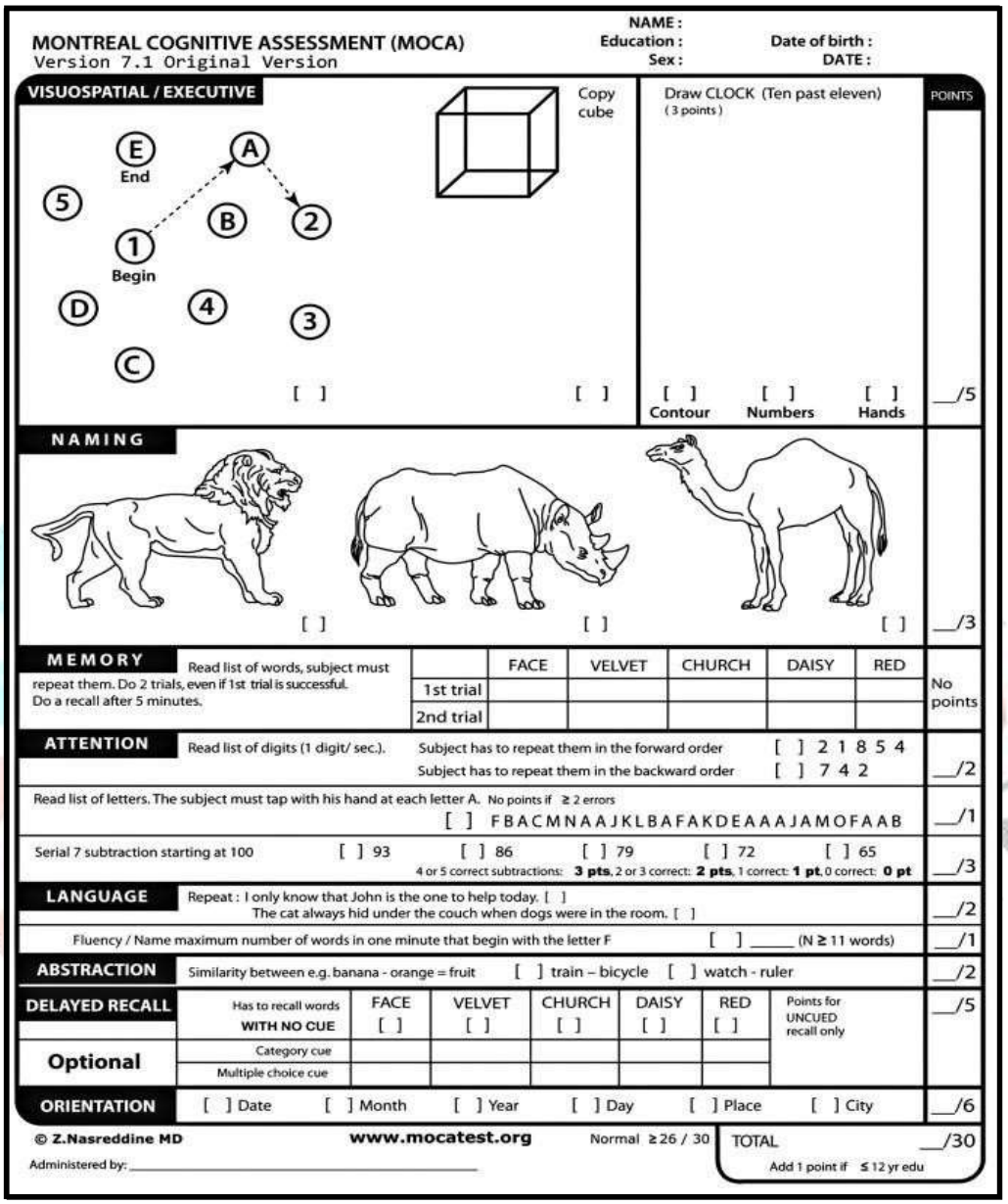
Limitations [3]

A low score does not always mean dementia. Low scores can also be due to

- Physical problems
- Intellectual disability
- Language or speech problems
- Education level
- Cultural differences

Montreal Cognitive Assessment [MoCA]

It is a test used to detect mild cognitive decline and early signs of dementia. It is used as a way to diagnose diseases like Alzheimer's disease and screen for conditions like Parkinson's disease, brain tumors, substance abuse and head trauma. It contains 30 questions and takes 10 minutes to complete. [5]



MONTREAL COGNITIVE ASSESSMENT (MOCA)
Version 7.1 Original Version

NAME :
Education : Date of birth :
Sex : DATE :

VISUOSPATIAL / EXECUTIVE — POINTS

Copy cube [ ] [ ]

Draw CLOCK (Ten past eleven) (3 points) [ ] Contour [ ] Numbers [ ] Hands __/5

NAMING [ ] [ ] [ ] __/3

MEMORY — Read list of words, subject must repeat them. Do 2 trials, even if 1st trial is successful. Do a recall after 5 minutes. No points

	FACE	VELVET	CHURCH	DAISY	RED
1st trial					
2nd trial					

ATTENTION — Read list of digits (1 digit/ sec.). __/2
Subject has to repeat them in the forward order [ ] 2 1 8 5 4
Subject has to repeat them in the backward order [ ] 7 4 2

Read list of letters. The subject must tap with his hand at each letter A. No points if ≥ 2 errors __/1
[ ] F B A C M N A A J K L B A F A K D E A A A J A M O F A A B

Serial 7 subtraction starting at 100 [ ] 93 [ ] 86 [ ] 79 [ ] 72 [ ] 65 __/3
4 or 5 correct subtractions: **3 pts**, 2 or 3 correct: **2 pts**, 1 correct: **1 pt**, 0 correct: **0 pt**

LANGUAGE — Repeat : I only know that John is the one to help today. [ ] __/2
The cat always hid under the couch when dogs were in the room. [ ]

Fluency / Name maximum number of words in one minute that begin with the letter F [ ] _____ (N ≥ 11 words) __/1

ABSTRACTION — Similarity between e.g. banana - orange = fruit [ ] train – bicycle [ ] watch - ruler __/2

DELAYED RECALL — __/5

	FACE	VELVET	CHURCH	DAISY	RED	Points for UNCUED recall only
Has to recall words WITH NO CUE	[ ]	[ ]	[ ]	[ ]	[ ]	
Optional: Category cue						
Optional: Multiple choice cue						

ORIENTATION [ ] Date [ ] Month [ ] Year [ ] Day [ ] Place [ ] City __/6

© Z.Nasreddine MD www.mocatest.org Normal ≥ 26 / 30

TOTAL __/30
Add 1 point if ≤ 12 yr edu

Administered by: _____

The MoCA test examines seven domains of cognitive function with a total of 11 different exercise and tasks [5]

1. Executive and visuospatial
2. Naming
3. Attention
4. Language
5. Abstraction
6. Delayed recall
7. Orientation

Score [5]

The total score on the MoCA test ranges from 0 to 30. Normal cognition 26-30
Mild cognitive impairment 18-25 Moderate cognitive impairment 10-17 Severe cognitive impairment < 10

Limitations [6]

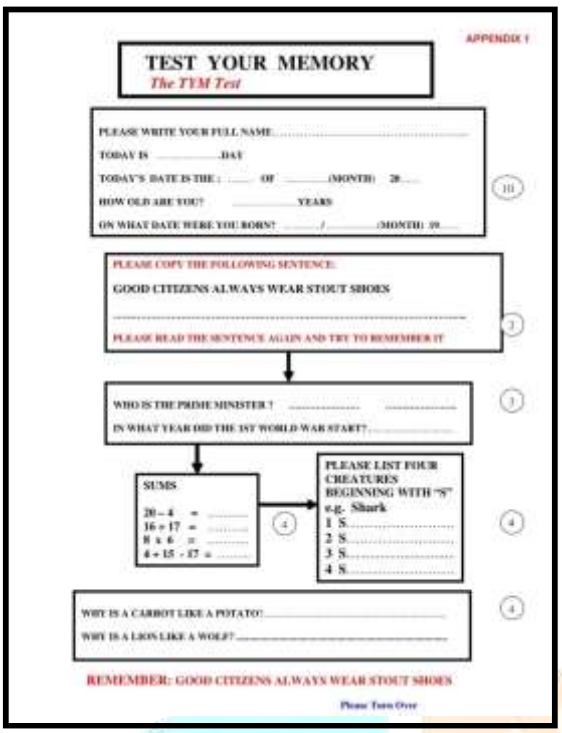
- Lack of detail
- Educational bias
- Inaccurate for certain populations
- Requires training for interpretation
- Affected by mental health conditions
- Inappropriate for long term monitoring

Test Your Memory [TYM]

It is a short, self-administered screening cognitive instrument designed for the detection of Alzheimer's disease [AD] [7]. The TYM test is a short cognitive test consisting of 10 tasks presented on 2 sides of a single sheet of card. Most people take about 5 minutes to complete the TYM. [8]

TYM examines 10 domains which include

1. Orientation to time and person
2. Copying a sentence
3. Recall of facts (Retrograde memory)
4. Arithmetic (sums)
5. Animal Fluencies (fluencies)
6. Similarities
7. Naming
8. Spotting the letter W (Visuo spatial ability 1)
9. Completing a clock (visuo spatial 2)
10. Recall of the sentence (Anterograde memory)
11. Help needed to complete the test (help)


APPENDIX 1

TEST YOUR MEMORY

The TYM Test

PLEASE WRITE YOUR FULL NAME.....

TODAY IS .....DAY

TODAY'S DATE IS THE : ..... OF .....(MONTH) 20.....

HOW OLD ARE YOU? .....YEARS

ON WHAT DATE WERE YOU BORN? ...../...../.....(MONTH) 19.....

(10)

PLEASE COPY THE FOLLOWING SENTENCE:

GOOD CITIZENS ALWAYS WEAR STOUT SHOES

.....

PLEASE READ THE SENTENCE AGAIN AND TRY TO REMEMBER IT

(1)

WHO IS THE PRIME MINISTER ? ....

IN WHAT YEAR DID THE 1ST WORLD WAR START? .....

(1)

SUMS

20 – 4 = ...

16 + 17 = ...

8 x 6 = ...

4 + 15 - 17 = ...

(4)

PLEASE LIST FOUR CREATURES BEGINNING WITH "S"

e.g. Shark

1 S.....

2 S.....

3 S.....

4 S.....

(4)

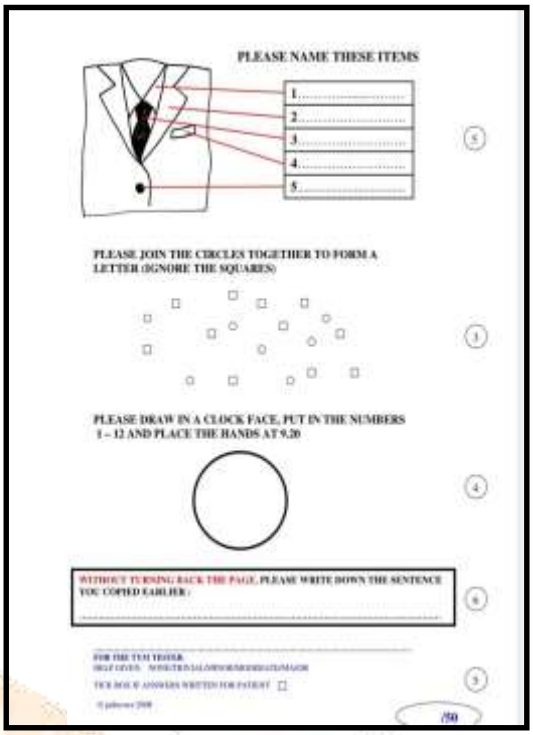
WHY IS A CARROT LIKE A POTATO?.....

WHY IS A LION LIKE A WOLF?.....

(4)

REMEMBER: GOOD CITIZENS ALWAYS WEAR STOUT SHOES

Please Turn Over


PLEASE NAME THESE ITEMS

1.....

2.....

3.....

4.....

5.....

(5)

PLEASE JOIN THE CIRCLES TOGETHER TO FORM A LETTER (IGNORE THE SQUARES)

(1)

PLEASE DRAW IN A CLOCK FACE, PUT IN THE NUMBERS 1 – 12 AND PLACE THE HANDS AT 9.20

(1)

WITHOUT TURNING BACK THE PAGE, PLEASE WRITE DOWN THE SENTENCE YOU COPIED EARLIER :

.....

(6)

FOR THE TYM TESTER

.....

(3)

/50

Score: [10]

Severe cognitive impairment <33

Mild cognitive impairment 33 and 45 (if >80 years of age) or 33 and 46 (if <80 years of age)

Normal cognitive ageing >45 (if >80 years of age) or 46 (if <80 years of age)

Dementia Rating Scale [DRS]

It is a measure of general cognitive status. The scale includes 36 tasks which are grouped into five subscales assessing different cognitive domains, namely:

1. Attention
2. Initiation/Perseveration (I/P)
3. Construction
4. Conceptualization
5. Memory

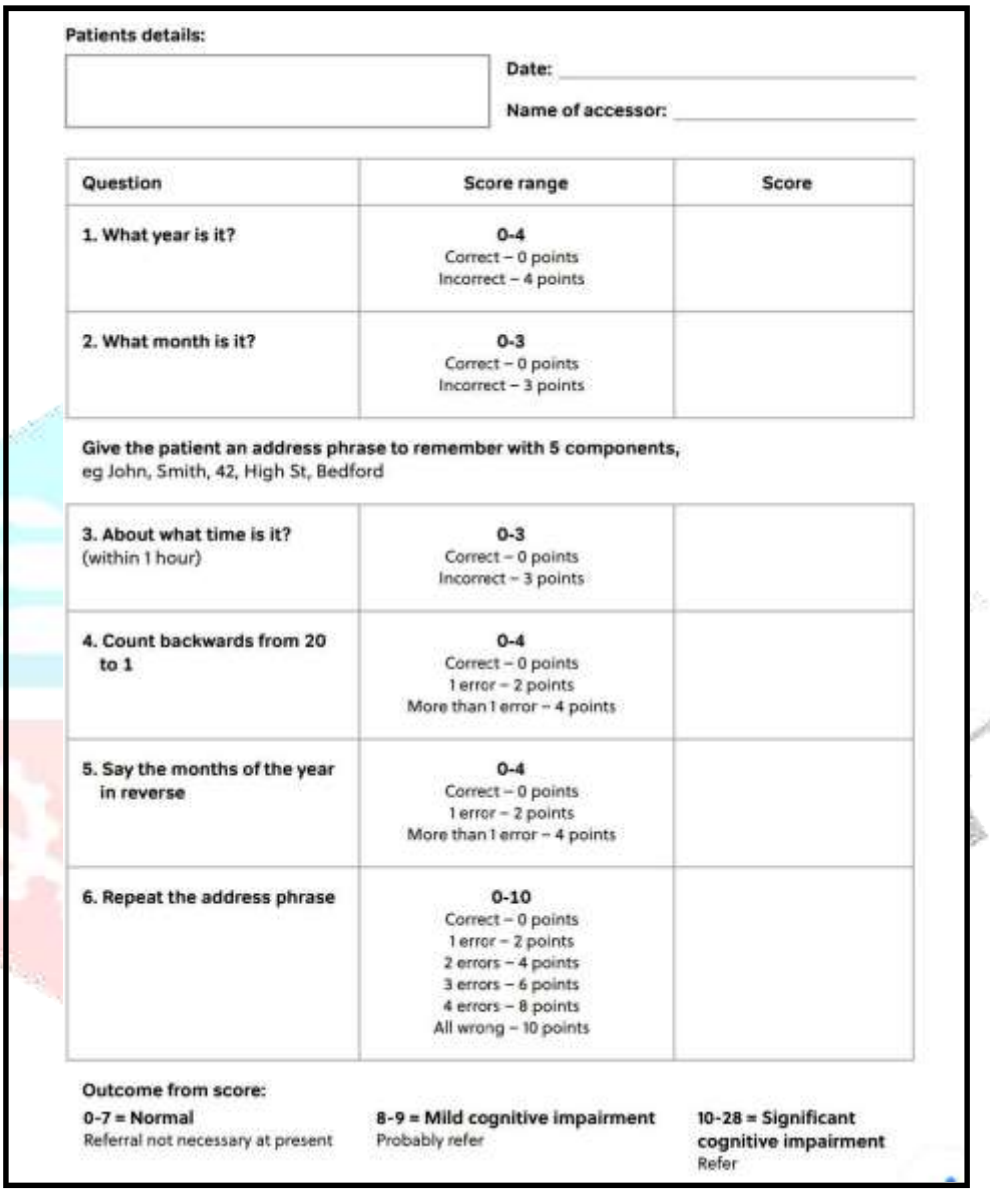
Subscale	Subtests	Maximum points
Attention	Digit span	37
	Commands	
	Imitation	
	Letter A counting (two tasks)	
	Word list reading	
	Visual matching	
Initiation/ Perseveration	Verbal fluency tests (supermarket products and body parts)	37
	Sound repetition	
	Alternating movements	
	Graphomotor design	
Construction	Copying designs	6
Conceptualization	Similarities	39
	Inductive reasoning	
	Differences	
	Similarities – Multiple choice	
Memory	Orientation	25
	Verbal recall – reading and sentence generated by the examinee	
	Verbal recognition (word list reading from the Attention subscale)	
	Visual recognition (visual matching from the Attention subscale)	
Total score		144

Sources: Scoring Booklet* and Strauss et al.[3]
*The scoring booklet of the Brazilian adaptation was kindly provided by the Department of Neurology - Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo.[7]

Six-item Cognitive Impairment Test (6 CIT)

It was designed to assess global cognitive status in dementia. It comprises six questions for three domains.

1. Memory
2. Calculation
3. Orientation[12]



Patients details:

Date: _____

Name of accessor: _____

Question	Score range	Score
1. What year is it?	**0-4** Correct – 0 points Incorrect – 4 points	
2. What month is it?	**0-3** Correct – 0 points Incorrect – 3 points	

Give the patient an address phrase to remember with 5 components,
eg John, Smith, 42, High St, Bedford

3. About what time is it? (within 1 hour)	**0-3** Correct – 0 points Incorrect – 3 points	
4. Count backwards from 20 to 1	**0-4** Correct – 0 points 1 error – 2 points More than 1 error – 4 points	
5. Say the months of the year in reverse	**0-4** Correct – 0 points 1 error – 2 points More than 1 error – 4 points	
6. Repeat the address phrase	**0-10** Correct – 0 points 1 error – 2 points 2 errors – 4 points 3 errors – 6 points 4 errors – 8 points All wrong – 10 points	

Outcome from score:

0-7 = Normal
Referral not necessary at present

8-9 = Mild cognitive impairment
Probably refer

10-28 = Significant cognitive impairment
Refer

Score:

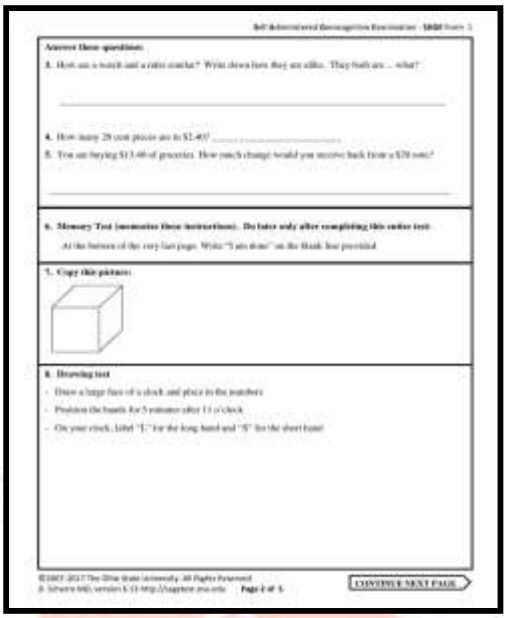
Normal 0-7

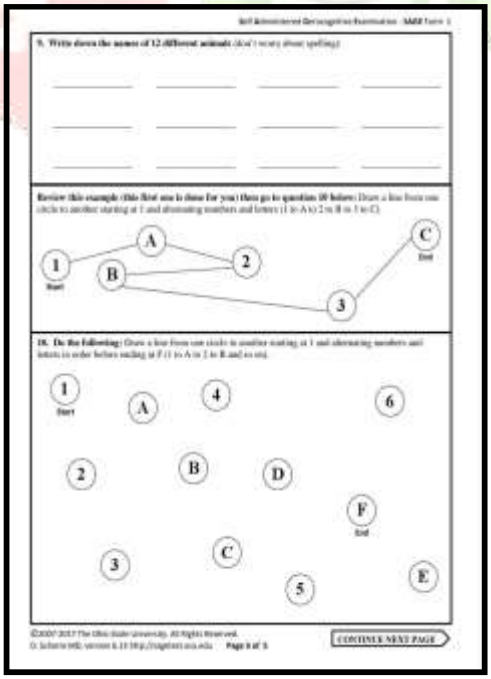
Mild cognitive impairment 8-9 significant cognitive impairment 10-28

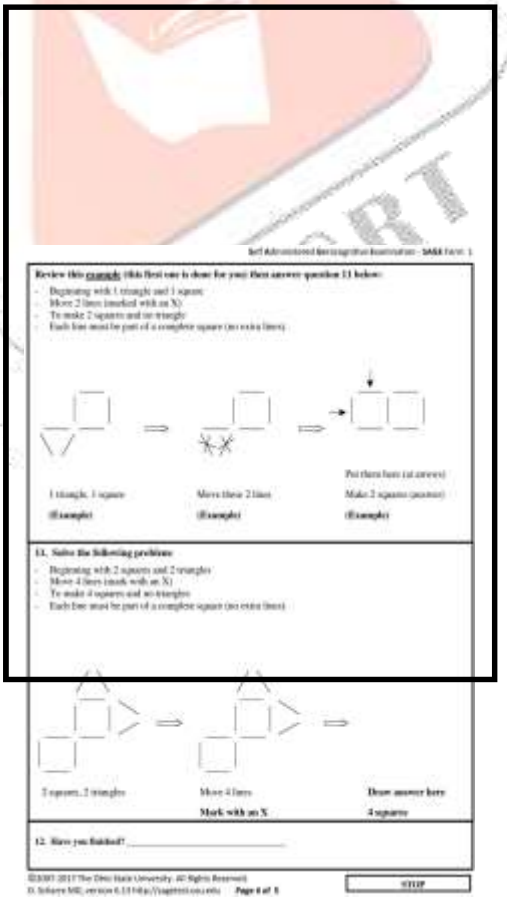
Self-Administered Gerocognitive Exam [SAGE][13]

It is a written test that is used as a diagnostic tool. This test is done through a series of questions that test

1. Logical thinking
2. Recall
3. Language
4. Problem-solving



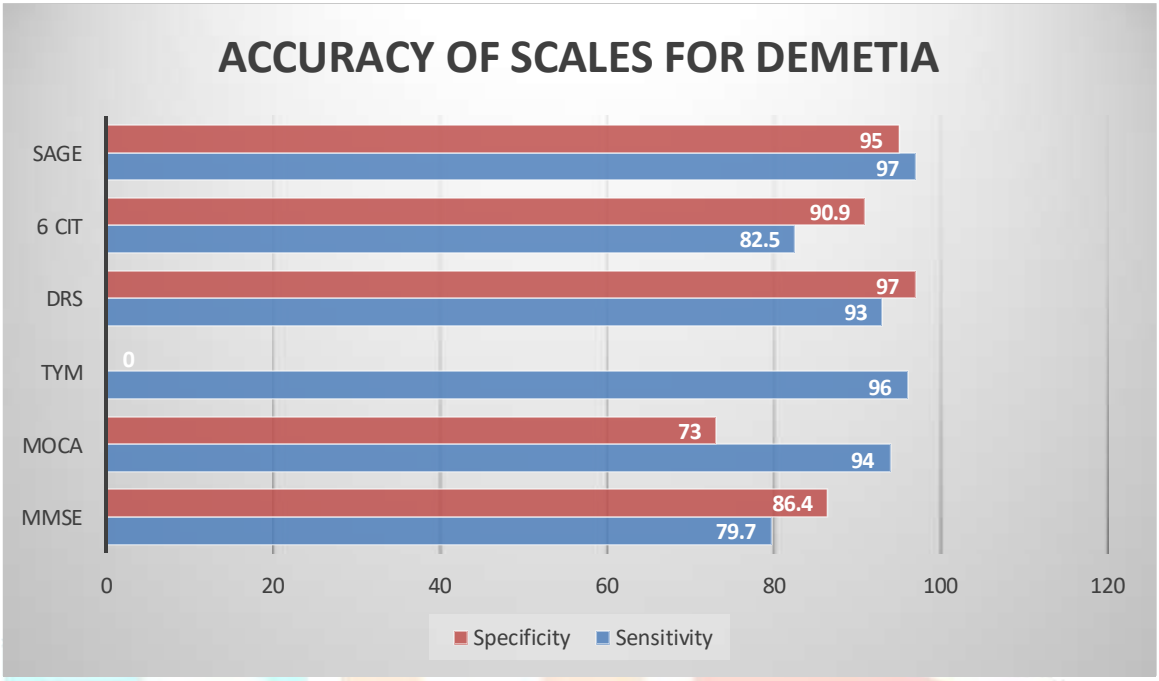




Score:

Mild cognitive impairment 15 or 16

Probable dementia <14



Conclusion:

The diverse scales and assessment tools for dementia reviewed in this article highlights the complexity and multidimensional nature of the condition. Each scale, whether cognitive, functional or behavioral, offers unique strengths and specific applications, making them valuable in different clinical and research contexts. Tools such as Mini-Mental State Examination (MMSE) and the Montreal Cognitive Assessment (MoCA) are widely utilized for cognitive screening, while instruments like the Clinical Dementia Rating (CDR) provide comprehensive staging of dementia severity.

The review underscores the importance of selecting dementia scales to specific purposes, whether for diagnosis, monitoring progression, or evaluating treatment outcomes. Each scale offers unique strengths and limitations, often to specific clinical needs, cognitive domains, or cultural contexts. Ultimately, a careful selection of scales, tailored to clinical objectives and patient needs, remains essential for improving diagnosis, treatment planning and quality of life for individuals with dementia.

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