

Test Administration and Scoring Manual



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# MSAD TOOL OVERVIEW

The **Mobility Staging Tool for Advanced Dementia** (MSAD) was developed at Toronto Rehabilitation Institute – University Health Network, Toronto, Canada for staging severity of mobility impairment in individuals with dementia. The information included in the MSAD tool was derived from a comprehensive review of mobility assessment tools, and a consensus exercise involving academic and clinical experts in mobility and dementia who identified key factors that impact on mobility in people with dementia (Van Ooteghem et al 2018, 2019).

MSAD is designed to describe the functional mobility stage of an individual with dementia. It is a **5-point scale** in which MSAD-0 denotes no mobility impairment, and the remaining four points represent various stages of functional mobility impairment from least (Stage 1) to most (Stage 4) impaired.

"W" is a **modifier** used to denote individuals who move around their environment primarily by manual (self-propelled) or electric wheelchair.

The functional mobility rating is sub-classified using an alpha subscore from **A to C** that expresses the degree to which specific mobility impairments impact on the performance and safety of an individual's overall mobility. In assigning a global MSAD rating, the 8 modifiers of mobility impairment are individually scored. These modifiers are: postural control, gait, agitation, impulsivity, visuospatial abilities, pain, fall history, and ability to use a mobility aid such as a cane or walker.

The **Global Mobility Rating** is derived based on a set of scoring rules as described on the right.

#### **Mobility Impairment Rating**

0 1 2 3 4

# Wheelchair modifier Rating **OW 1W 2W 3W**

Modifiers of Mobility Impairment Rating

A B C

Π

**Overall Mobility Rating** 

<b>1A</b>	<b>1B</b>	1C	W
<b>2A</b>	<b>2B</b>	<b>2C</b>	W
<b>3A</b>	<b>3B</b>	<b>3C</b>	W
<b>4A</b>	<b>4B</b>	<b>4C</b>	W

# 2 TEST ADMINISTRATION

The MSAD tool is designed to be largely observational, to capture how someone is moving naturally in their environment. It helps to spend some time observing the individual as they mobilize. These observations may be supplemented with clinical knowledge of the individual, for example, with information about his/her fall history.

### PART (1) Mobility Impairment Stage

Part I of this tool is designed to categorize the functional ability of the individual with dementia into one of four levels, by examining two facets of mobility - the extent to which the individual requires assistance with walking and postural transitions (**Independence in Mobility**), and the individual's ability to move easily through different environments or settings (**Mobility Performance**).

To complete this section, consider the **past week.** Score based on the degree to which the individual required help with mobility, and the extent to which they were able, *with this help*, to move around the environment in order to complete their activities of daily living.

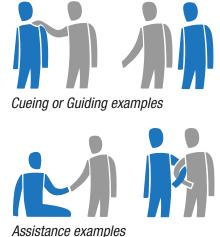
	0	1	2	3	4
	NO DIFFICULTY	MILD	MODERATE	SEVERE	DEPENDENT
INDEPENDENCE IN MOBILITY Ability to walk and complete sit-to-stand transitions:	Without any supervision or assistance	With occasional cueing or guiding	With frequent cueing or guiding or rare assistance	Occasionally or often requires assistance	Dependent on assistance or wheelchair for mobility
MOBILITY PERFORMANCE Ability to move around:	Freely in the outdoor environment	Freely explores whole indoor environment (e.g. travels 50m with- out stopping)	Short distances within the indoor environment (e.g. travels 15m with/ without stops)	Within their room	Unable to move independently around their environment

Part I on page 1 of MSAD tool, see Appendix for full tool

### **INDEPENDENCE IN MOBILITY**

"Cueing or Guiding" refers to directions or instructions that you might provide to someone to help him/her execute a mobility task. Examples could include reminders to use the handrail or armrests, or to be cautious when standing. It could also include giving instructions about using a gait aid, or gently taking someone's elbow or hand to direct them, rather than to provide physical support.

"Assistance" refers to any physical support, however brief, required to complete a mobility task Examples could include helping someone stand or sit by allowing him/her to hold your arm or hand, or any assistance with lifting or repositioning.



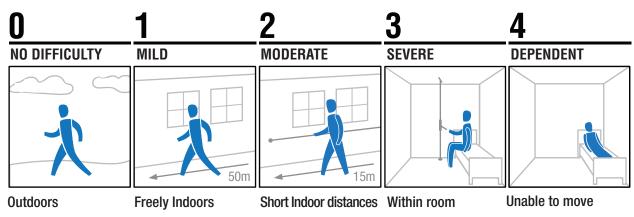
#### **MOBILITY PERFORMANCE**

Mobility performance refers to whether someone is able to move around their environment. It should be scored in the context of the individual's level of independence. That is, a measure of his/her mobility performance **with whatever cueing, guiding, or assistance that is needed**. The score is based on **how they have performed in their current environment** in the previous week.

The hierarchy here is from an ability to move outdoors (rating of 0), to any distance indoors (rating of 1), to shorter distances indoors (rating of 2), to within a room (rating of 3), to the inability to move around at all (rating of 4).

Moving "freely", either in the outdoor environment or throughout the indoor environment refers to whether someone is capable of moving **50m without needing to stop or rest**. If an individual has not had an opportunity to go outdoors this week, but you are confident that he or she could have safely performed outdoor walking in the past week (such as taken a walk around the block), you can rate them Stage 0 (No difficulty).

"Short distances within the indoor environment" refers to whether someone is capable of moving **15m with or without needing to stop or rest.** 



Mobility performance scoring hierarchy

### PART 2 Modifiers of Mobility Impairment

Part II of the staging tool considers factors that modify or impact functional mobility impairment. It has been designed to account for the many different ways that mobility is impaired in dementia. For example, an individual could be highly independent, yet very impulsive; or they may be very limited in their mobility-related functional capacity, but be highly restless.

The modifiers included in the MSAD have been selected based on factors determined to be high priority for inclusion according to academic and clinical experts in mobility and dementia (Van Ooteghem et al, 2019). Each factor is divided into three categories. Each factor should be scored individually and only one category per factor may be selected. The text guides the rater to identify the extent to which this single factor is impacting on an individual's mobility, but it is possible that more than one category may apply to someone. Additional detail, provided below, may inform a final decision. The aim is to make a decision about whether overall, this factor has **minimal, moderate, or significant impact on mobility**. In situations where the rater cannot decide between two categories for a factor, the higher (more impaired) category should be chosen.

In addition to the features included in the tool, please refer to the following additional features/descriptions to help distinguish the categories.

	Α	В	C
	MINIMAL IMPACT ON MOBILITY	MODERATE IMPACT ON MOBILITY	SIGNIFICANT IMPACT ON MOBILITY
FALLS HISTORY (within 3 months)	= No falls	= One or two falls	= Recurrent falling
PAIN	Moves without discomfort	<ul> <li>Moves with some discomfort</li> <li>Grimaces when moving or being moved</li> </ul>	<ul> <li>Moves with significant discomfort</li> <li>Resists or avoids moving due to pain</li> </ul>
AGITATION	Moves around calmly     Sits and positively engages in activities     Exhibits little to no distress     Or symptoms do not impact mobility	<ul> <li>Paces or searches environment</li> <li>Can be restless when sitting or in bed</li> <li>Has moments when anxious or distressed</li> </ul>	Moves rapidly through the environment     Unable to sit restfully for more than a few moments     Exhibits anxiety, fear, anger, or aggression towards others
IMPULSIVITY	Does not move impulsively     Usually considers need for     safety when moving	<ul> <li>Occasionally moves impulsively or rushes with little consideration for safety</li> </ul>	Often moves impulsively     Often rushes or performs     risky activities with no     consideration for safety
VISUOSPATIAL ABILITIES	<ul> <li>No or minimal visual impairment or neglect</li> <li>Able to visually navigate the environment</li> </ul>	<ul> <li>Some visual impairment or neglect</li> <li>Occasionally misjudges distances or bumps into obstacles</li> </ul>	<ul> <li>Significant visual impairment or neglect</li> <li>Unable to safely navigate the environment with vision</li> </ul>
Score for individuals wi	th a part 1 rating of 1, 2, or 3 only:		
POSTURAL Control	<ul> <li>Stands erect or nearly erect</li> <li>Able to recover from loss of balance within one or two steps</li> </ul>	<ul> <li>Moderately stooped or leaning</li> <li>Sometimes reacts to loss of balance but not consistent</li> <li>Sometimes appears dizzy or sways when standing</li> </ul>	<ul> <li>Significantly stooped or leaning</li> <li>Poor response to loss of balance</li> <li>Has episodes of dropping suddenly from standing</li> </ul>
GAIT	Walks steadily and fluidly with a normal pattern and rhythm Good balance when walking or turning	Some loss of usual walking pattern and rhythm     Some imbalance when walking or turning	Abnormal walking pattern and rhythm     Loses balance when turning     Parkinsonian gait
ABILITY TO USE Mobility Aid(S)	<ul> <li>No aid required or uses aid appropriately</li> </ul>	<ul> <li>Uses aid appropriately but inconsistently</li> </ul>	<ul> <li>Uses aid inappropriately or refuses to use prescribed aid</li> <li>Aid a hazard at times</li> </ul>

Part II on page 2 of MSAD tool, see Appendix for full tool

FALLS HISTORY (within 3 months)			
Α	В	C	
MINIMAL IMPACT	MODERATE IMPACT	SIGNIFICANT IMPACT	
No falls	One or two falls	Recurrent falling	
<ul> <li>Falls occurring due to overwhelming external force (e.g., a large push) or loss of consciousness are not counted</li> </ul>	<ul> <li>Has experienced a loss of balance event ending with the person on the floor or ground</li> </ul>	More than two events as per B	

PAIN		
Α	В	C
MINIMAL IMPACT	MODERATE IMPACT	SIGNIFICANT IMPACT
Moves without discomfort	<ul> <li>Moves with some discomfort</li> <li>Grimaces when moving or being moved</li> </ul>	<ul> <li>Moves with significant discomfort</li> <li>Resists or avoids moving due to pain</li> </ul>
		<ul> <li>Vocalizes pain or demonstrates pain behaviors</li> </ul>

AGITATION			
<b>A</b> Minimal Impact	<b>B</b> Moderate impact	C SIGNIFICANT IMPACT	
<ul> <li>Moves around calmly</li> <li>Sits and positively engages in activities</li> <li>Exhibits little to no distress</li> <li>Or symptoms do not impact mobility</li> </ul>	<ul> <li>Paces or searches environment</li> <li>Can be restless when sitting or in bed</li> <li>Has moments when anxious or distressed</li> </ul>	<ul> <li>Moves rapidly through the environment</li> <li>Unable to sit restfully for more than a few moments</li> <li>Exhibits anxiety, fear, anger, or aggression towards others</li> </ul>	
<ul> <li>Appears to feel safe and secure in the environment</li> <li>Able to follow cues or requests from others</li> </ul>	<ul> <li>Occasionally moves rapidly or intensely</li> <li>Can sometimes be redirected or reassured</li> </ul>	May climb on or move furniture	

A	<u>B</u>	<u>c</u>
MINIMAL IMPACT	MODERATE IMPACT	SIGNIFICANT IMPACT
<ul> <li>Does not move impulsively</li> <li>Usually considers need for safety when moving</li> </ul>	<ul> <li>Occasionally moves impulsively or rushes with little consideration for safety</li> </ul>	Often moves impulsively Often rushes or performs risky activities with no consideration for safety
	<ul> <li>Occasional impulsive behavior may include sitting without being close enough to a chair, standing before wheelchair brakes are applied, walking without help even if unsafe to do so</li> </ul>	<ul> <li>Often moves impulsively as per examples in B</li> </ul>

VISUOSPATIAL ABILITIES		
Α	В	c V
MINIMAL IMPACT	MODERATE IMPACT	SIGNIFICANT IMPACT
<ul> <li>No or minimal visual impairment or neglect</li> <li>Able to visually navigate the environment</li> </ul>	<ul> <li>Some visual impairment or neglect</li> <li>Occasionally misjudges distances or bumps into obstacles</li> </ul>	<ul> <li>Significant visual impairment or neglect</li> <li>Unable to safely navigate the environment with vision</li> </ul>
	<ul> <li>Occasional or mild difficulty judging distances and avoiding obstacles as demonstrated by bumping into walls and door frames, or missing chair when trying to sit</li> </ul>	<ul> <li>Often or significant difficulty as per B</li> </ul>

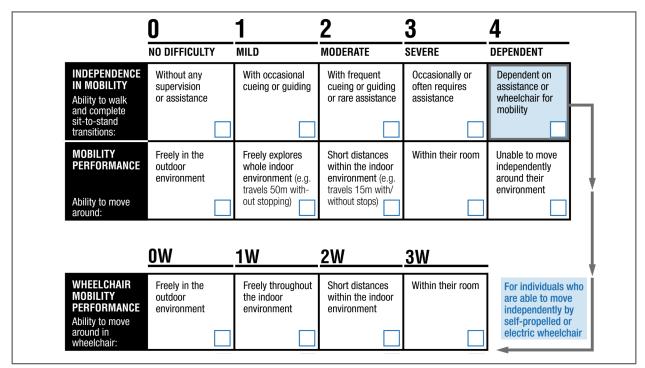
POSTURAL CONTROL (Do not score if impairment stage 4)				
Α	В	<u>c</u>		
MINIMAL IMPACT	MODERATE IMPACT	SIGNIFICANT IMPACT		
<ul> <li>Stands erect or nearly erect</li> <li>Able to recover from loss of balance within one or two steps</li> </ul>	<ul> <li>Moderately stooped or leaning</li> <li>Sometimes reacts to loss of balance but not consistent</li> <li>Sometimes appears dizzy or sways when standing</li> </ul>	<ul> <li>Significantly stooped or leaning</li> <li>Poor response to loss of balance</li> <li>Has episodes of dropping suddenly from standing</li> </ul>		
Can stand 2 minutes without help Does not need any assistance to maintain balance Consistently able to recover from loss of balance within a few steps Only mildly stooped or leaning	<ul> <li>Can stand for 30 seconds without help</li> <li>May at times use railings to steady themselves</li> <li>Able to recover from imbalance but not consistently</li> </ul>	<ul> <li>Unable to stand for 30 seconds without help</li> <li>Needs mobility aid or assistance to maintain balance</li> <li>Relies on furniture, walls, railings to maintain balance</li> <li>Absent or ineffective reactive balance response</li> </ul>		

A	В	<u>c</u>	
MINIMAL IMPACT	MODERATE IMPACT	SIGNIFICANT IMPACT	
<ul> <li>Walks steadily and fluidly with a normal pattern and rhythm</li> <li>Good balance when walking or turning</li> </ul>	<ul> <li>Some loss of usual walking pattern and rhythm</li> <li>Some imbalance when walking or turning</li> </ul>	<ul> <li>Abnormal walking pattern and rhythm</li> <li>Loses balance when turning</li> <li>Parkinsonian gait</li> </ul>	
<ul> <li>Walks with consistent and appropriate step length and width</li> <li>Pace is consistent during straight- line walking</li> </ul>	Walks with some variability in step length and width Some variability in pace Tentative or hesitant, and/or quick or incautious at times	<ul> <li>Abnormal step length, width, direction, or limb movement</li> <li>Considerable variation in pace, tentative or hesitant, and/or very fast and careless</li> <li>Grossly abnormal gait features: for example, legs scissoring, poor for clearance, gait apraxia</li> <li>Parkinsonian gait: slow with shuffling or freezing</li> </ul>	

ABILITY TO USE MOBILITY AID(S) (Do not score if impairment stage 4)			
Α	В	C	
MINIMAL IMPACT	MODERATE IMPACT	SIGNIFICANT IMPACT	
No aid required or uses aid appropriately	<ul> <li>Uses aid appropriately but inconsistently</li> </ul>	<ul> <li>Uses aid inappropriately or refuses to use prescribed aid</li> <li>Aid a hazard at times</li> </ul>	
	<ul> <li>Forgets to use aid</li> <li>Accepts the aid when reminded</li> </ul>	<ul> <li>Lacks cognitive abilities to use aid</li> <li>Needs frequent direction and assistance to use aid properly</li> <li>Refuses to use aid at times</li> </ul>	

### PART 1 Mobility Impairment Stage

If someone scores 4 (dependent) on Independence in Mobility, and he/she drives or propels a wheelchair independently, score based on Mobility Performance for wheelchair users, adding the W modifier. If the individual is unable to self-propel, score as stage 4.



Part I on page 1 of MSAD tool, see Appendix for full tool

0	1	2	3	4	Individual unable to self-propel (score 4)
Modifie	r <b>OW</b>	1W	<b>2W</b>	<b>3W</b>	Able to self-propel (score with W modifier)

Scoring examples. Score on page 1 of MSAD tool

Otherwise, the final score for this section is the score reflecting the greatest degree of impairment out of the two categories of Independence in Mobility and Mobility Performance.

### PART 2 Modifiers of Mobility Impairment

The overall scoring for this section is based on the number of Bs and Cs present, following this sequence:

- •If two or more factors score C, the overall alpha-score is C.
- •If two or more factors score B or B+C, the overall alpha-score is B.
- •If none of the above criteria are met, the overall alpha-score is A.



Scoring part II, pg. 2 of MSAD tool

### **Overall Mobility Rating**

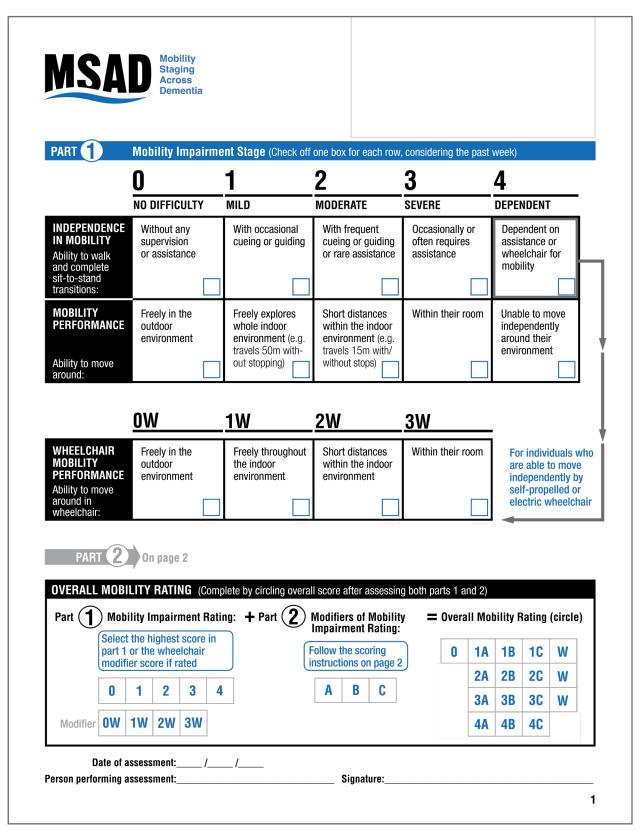
The global mobility rating score or mobility stage is represented by the numeric score obtained in Part I + the alpha-score obtained in Part II (e.g. stage 3B). If an individual moves primarily by wheelchair, this rating is appended with a "W" (e.g. stage 3B(W)).

art (1						+ Part 2 Modifiers of Mobility Impairment Rating:	=	Overa	all Mot	oility F	Rating	(circle
	Select the highest score in part 1 or the wheelchair modifier score if rated			elchair	IN	Follow the scoring instructions on page 2		0	<b>1</b> A	<b>1B</b>	1C	W
									<b>2</b> A	2B	2C	W
	0	1	2	3	4	A B C			3A	3B	3C	W
/lodifier	ow	1W	2W	3W					4A	4B	4C	

Global Mobility Rating scored on pg.1 of MSAD tool, see Appendix for full tool

### REFERENCES

### **APPENDIX**



MSAD Tool, page 1

PART 2	Modifiers of Mobility Impairm					
	A Minimal Impact on Mobility	<b>B</b> MODERATE IMPACT ON MOBILITY	C Significant impact on mobilit			
FALLS HISTORY (within 3 months)	= No falls	One or two falls	Recurrent falling			
PAIN	Moves without discomfort	<ul> <li>Moves with some discomfort</li> <li>Grimaces when moving or being moved</li> </ul>	<ul> <li>Moves with significant discomfort</li> <li>Resists or avoids moving due to pain</li> </ul>			
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IMPULSIVITY	<ul> <li>Does not move impulsively</li> <li>Usually considers need for safety when moving</li> </ul>	<ul> <li>Occasionally moves impulsively or rushes with little consideration for safety</li> </ul>	<ul> <li>Often moves impulsively</li> <li>Often rushes or performs risky activities with no consideration for safety</li> </ul>			
VISUOSPATIAL Abilities	<ul> <li>No or minimal visual impairment or neglect</li> <li>Able to visually navigate the environment</li> </ul>	<ul> <li>Some visual impairment or neglect</li> <li>Occasionally misjudges distances or bumps into obstacles</li> </ul>	<ul> <li>Significant visual impairment or neglect</li> <li>Unable to safely navigate the environment with vision</li> </ul>			
core for individuals w	ith a part 1 rating of <b>1, 2, or 3</b> only:					
POSTURAL Control	<ul> <li>Stands erect or nearly erect</li> <li>Able to recover from loss of balance within one or two steps</li> </ul>	<ul> <li>Moderately stooped or leaning</li> <li>Sometimes reacts to loss of balance but not consistent</li> <li>Sometimes appears dizzy or sways when standing</li> </ul>	<ul> <li>Significantly stooped or leaning</li> <li>Poor response to loss of balance</li> <li>Has episodes of dropping suddenly from standing</li> </ul>			
GAIT	<ul> <li>Walks steadily and fluidly with a normal pattern and rhythm</li> <li>Good balance when walking or turning</li> </ul>	<ul> <li>Some loss of usual walking pattern and rhythm</li> <li>Some imbalance when walking or turning</li> </ul>	<ul> <li>Abnormal walking pattern and rhythm</li> <li>Loses balance when turning</li> <li>Parkinsonian gait</li> </ul>			
ABILITY TO USE Mobility Aid(S)	<ul> <li>No aid required or uses aid appropriately</li> </ul>	<ul> <li>Uses aid appropriately but inconsistently</li> </ul>	<ul> <li>Uses aid inappropriately or refuses to use prescribed aid</li> <li>Aid a hazard at times</li> </ul>			

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