

Evaluation and Management of Dementia

Courtney Wellman, MD

Marshall University Department of Family and Community Health

Family Medicine and Geriatrics

Objectives

- Evaluate memory impairment
- Discuss tools for use in the diagnosis of dementia
- Understand the diagnostic criteria for dementia
- Examine methods to prevent dementia and mild cognitive impairment
- Learn how to treat dementia
- Discuss the new medications soon to be available for the treatment of dementia

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Memory Impairment

- Subjective memory complaint
- PMHx
- Medications
- Social history
- Functional assessment: ADLs IADLs

Dressing

Eating

Ambulating

Toileting

Hygiene

Shopping

Housekeeping

Accounting

Food prep



Memory Impairment

- Incontinence
- Falls
- Hx CVA/TIA
- Hallucinations
- Behaviors
- Head trauma
- Substance use (alcohol)

Physical Exam

- Full neurologic examination
- Key findings:
 - EOM
 - Muscle tone
 - Tremor
 - Gait
 - Coordination

Objectives

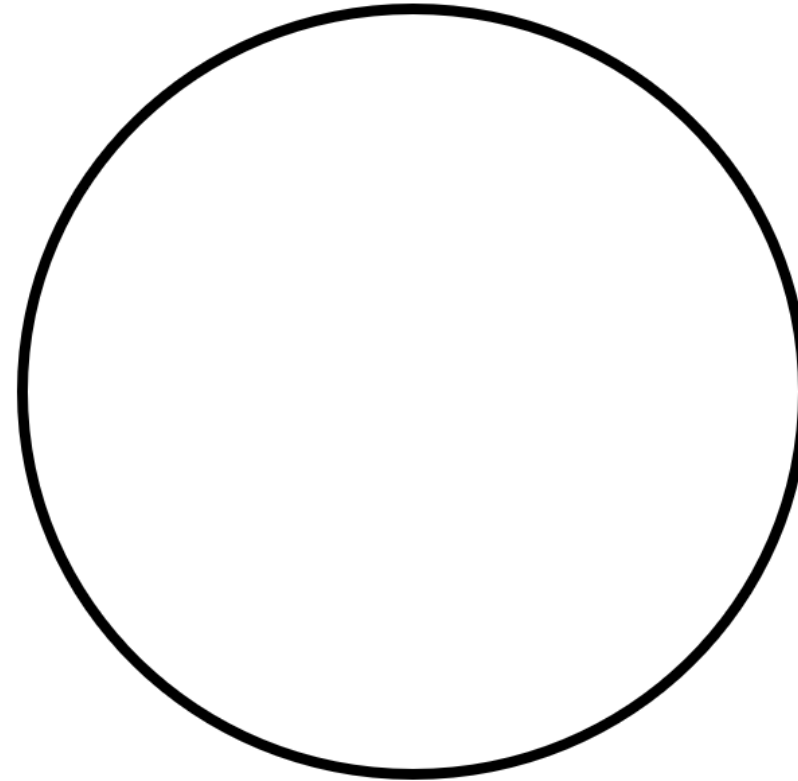
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Diagnostic tools

- Memory Evaluation:
 - Mini-Cog
 - Mini Mental Status Exam (MMSE)
 - Montreal Cognitive Assessment (MoCA)
 - St. Louis University Mental Status Examination (SLUMS)
- Mood evaluation
 - Geriatric depression scale (GDS)
 - Patient Health Questionnaire 9 (PHQ9)
 - Generalized Anxiety Disorder 7 (GAD7)

Patient Name: _____ DOB: _____

Mini-Cog
SN: 76-100%
SP: 27-85%



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v. 01.19.16

MMSE

Mini-Mental State Examination (MMSE)

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

Rovner BW, Folstein MF. Mini-mental state exam in clinical practice. *Hosp Pract* (Off Ed) 1987;22:99,103,106,110.

MONTREAL COGNITIVE ASSESSMENT (MOCA)

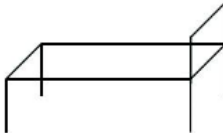
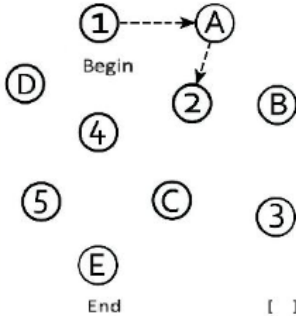
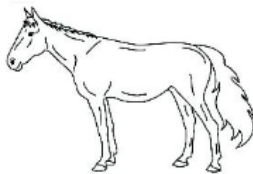
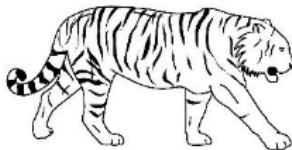
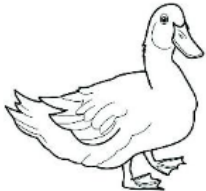
NAME : _____
 Education : _____ Date of birth : _____
 Sex : _____ DATE : _____

VISUOSPATIAL / EXECUTIVE		Copy cube		Draw CLOCK (Ten past eleven) (3 points)		POINTS			
[]		[]		[] Contour	[] Numbers	[] Hands			
[]		[]				___/5			
NAMING									
[]		[]		[]		___/3			
MEMORY		Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.		FACE	VELVET	CHURCH	DAISY	RED	No points
		1st trial							
		2nd trial							
ATTENTION		Read list of digits (1 digit/ sec.). 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		___/2
Read list of letters. The subject must tap with his hand at each letter A. No points if ≥ 2 errors				[]	F	B	A	C	M
				[]	N	A	A	J	K
				[]	L	B	A	F	A
				[]	K	L	B	A	F
				[]	A	K	D	E	A
				[]	A	A	A	J	A
				[]	M	O	F	A	A
				[]	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	4 or 5 correct subtractions: 3 pts, 2 or 3 correct: 2 pts, 1 correct: 1 pt, 0 correct: 0 pt				___/3	
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. []						___/2	
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		Has to recall words WITH NO CUE		FACE	VELVET	CHURCH	DAISY	RED	Points for UNCUE recall only
				[]	[]	[]	[]	[]	
Optional		Category cue							
		Multiple choice cue							
ORIENTATION		[]	Date	[]	Month	[]	Year	[]	Day
		[]	Place	[]	City			___/6	
© Z.Nasreddine MD Version November 7, 2004		Normal ≥ 26 / 30		TOTAL				___/30	
www.mocatest.org				Add 1 point if ≤ 12 yr edu					

MONTREAL COGNITIVE ASSESSMENT (MoCA®)

Version 8.3 English

Name: _____
 Education: _____ Date of birth: _____
 Sex: _____ DATE: _____

VISUOSPATIAL / EXECUTIVE								POINTS	
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Copy bed</p> </div> <div style="text-align: center;"> <p>Draw CLOCK (Five past ten)</p> <p>(3 points)</p> </div> </div>				<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Begin</p> <p>End</p> </div> <div style="text-align: center;"> <p>[]</p> </div> <div style="text-align: center;"> <p>[]</p> </div> <div style="text-align: center;"> <p>[]</p> </div> <div style="text-align: center;"> <p>[]</p> </div> <div style="text-align: center;"> <p>[]</p> </div> </div>				<p>___/5</p>	
NAMING									
 <p>[]</p>			 <p>[]</p>			 <p>[]</p>			<p>___/3</p>
MEMORY									
Read list of words, subject must repeat them. Do 2 trials, even if 1st trial is successful. Do a recall after 5 minutes.				LEG	COTTON	SCHOOL	TOMATO	WHITE	NO POINTS
1st TRIAL									
2nd TRIAL									
ATTENTION									
Read list of digits (1 digit/sec).				Subject has to repeat them in the forward order. [] 2 4 8 1 5					
				Subject has to repeat them in the backward order. [] 4 2 7					___/2
Read list of letters. The subject must tap with his hand at each letter A. No points if ≥ 2 errors.									
[] 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 60. [] 53 [] 46 [] 39 [] 32 [] 25									
4 or 5 correct subtractions: 3 pts, 2 or 3 correct: 2 pts, 1 correct: 1 pt, 0 correct: 0 pt									
___/3									
LANGUAGE									
Repeat: The child walked his dog in the park after midnight.				[]					
The artist finished his painting at the right moment for the exhibition.				[]					___/2
Language Fluency. Name maximum number of words in one minute that begin with the letter B. [] _____ (N ≥ 11 words)									
___/1									
ABSTRACTION									
Similarity between e.g. banana - orange = fruit				[] hammer - screwdriver [] matches - lamp					___/2
DELAYED RECALL									
(MIS)	Has to recall words WITH NO CUE	LEG	COTTON	SCHOOL	TOMATO	WHITE	Points for UNCUE recall only		___/5
X3		[]	[]	[]	[]	[]			
X2	Category cue								
X1	Multiple choice cue						MIS = ___/15		
ORIENTATION									
[] Date		[] Month		[] Year		[] Day		[] Place [] City	
___/6									
© Z. Nasreddine MD				www.mocatest.org				MIS: /15 (Normal ≥ 26/30)	
Administered by: _____				Total time: 4 min 30 sec (Normal ≤ 12 min) Add 1 point if ≤ 12 yr education				TOTAL ___/30	

Diagnostic Tools

Received: 15 June 2022 | Revised: 20 September 2022 | Accepted: 14 October 2022
DOI: 10.1111/jgs.18124

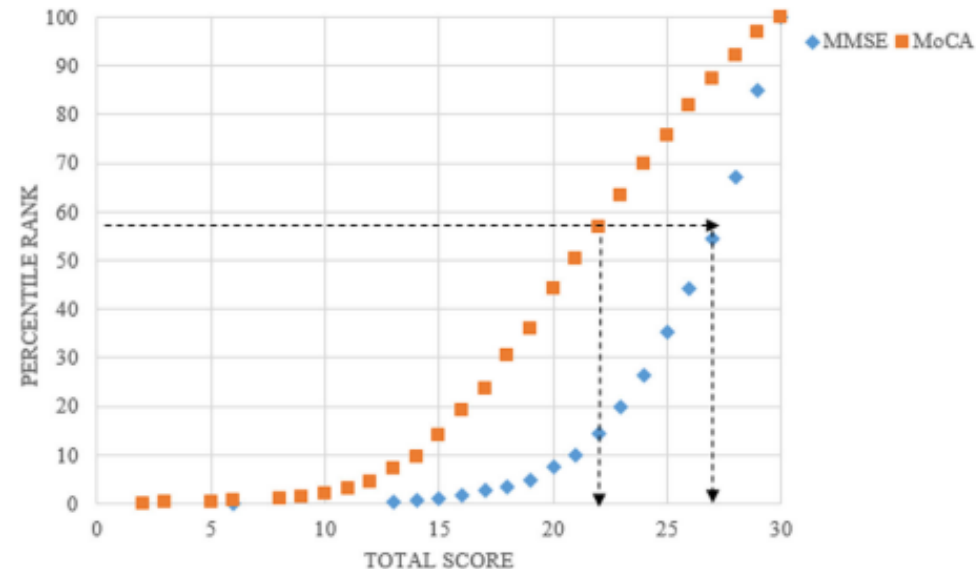
Conversion between MoCA and the Mini-Mental State Examination

Jael S. Fasnacht MSc¹
Alessandra E. Thoman MSc²
Klemens Gutbrod PhD³
Andreas U. Monsch PhD⁴

A COMPREHENSIVE TABLE OF EQUIVALENT SCORES

JAGS | 873

FIGURE 2 Equipercile equating in MoCA and MMSE values in 803 patients from the Memory Clinic FELIX PLATTER, Switzerland. MMSE values are given in raw values. MoCA values correspond to education-adjusted values. The dotted lines indicate that MoCA and MMSE values are set equal when their corresponding percentile ranks are equal. MMSE, mini mental status examination; MoCA, montreal cognitive assessment.



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SLUMS

VAMC SLUMS Examination

Questions about this assessment tool? E-mail aging@slu.edu.

Name _____ Age _____
Is patient alert? _____ Level of education _____

____/1

____/1

____/1

____/3

____/3


____/5

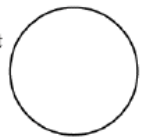
____/2

____/4

____/2

____/8

1. What day of the week is it?
2. What is the year?
3. What state are we in?
4. Please remember these five objects. I will ask you what they are later.
Apple Pen Tie House Car
5. You have \$100 and you go to the store and buy a dozen apples for \$3 and a tricycle for \$20.
1. How much did you spend?
2. How much do you have left?
6. Please name as many animals as you can in one minute.
1. 0-4 animals 2. 5-9 animals 3. 10-14 animals 4. 15+ animals
7. What were the five objects I asked you to remember? 1 point for each one correct.
8. I am going to give you a series of numbers and I would like you to give them to me backwards.
For example, if I say 42, you would say 24.
1. 87 2. 649 3. 8537
9. This is a clock face. Please put in the hour markers and the time at ten minutes to eleven o'clock.
2. Hour markers okay
2. Time correct
1. 10. Please place an X in the triangle. 
1. Which of the above figures is largest?
11. I am going to tell you a story. Please listen carefully because afterwards, I'm going to ask you some questions about it.
Jill was a very successful stockbroker. She made a lot of money on the stock market. She then met Jack, a devastatingly handsome man. She married him and had three children. They lived in Chicago. She then stopped work and stayed at home to bring up her children. When they were teenagers, she went back to work. She and Jack lived happily ever after.
2. What was the female's name?
2. When did she go back to work?
2. What work did she do?
2. What state did she live in?



TOTAL SCORE



SCORING		
HIGH SCHOOL EDUCATION		LESS THAN HIGH SCHOOL EDUCATION
27-30	Normal	25-30
21-26	MNCD*	20-24
1-20	Dementia	1-19

* Mild Neurocognitive Disorder

SH Tariq, N Tumosa, JT Chibnall, HM Perry III, and JE Morley. The Saint Louis University Mental Status (SLUMS) Examination for Detecting Mild Cognitive Impairment and Dementia is more sensitive than the Mini-Mental Status Examination (MMSE) - A pilot study. Am J Geriatr Psychiatry 14:900-910, 2006.

Geriatric Depression Scale (short form)

Instructions: Circle the answer that best describes how you felt over the past week.

- | | | |
|---|-----|----|
| 1. Are you basically satisfied with your life? | yes | no |
| 2. Have you dropped many of your activities and interests? | yes | no |
| 3. Do you feel that your life is empty? | yes | no |
| 4. Do you often get bored? | yes | no |
| 5. Are you in good spirits most of the time? | yes | no |
| 6. Are you afraid that something bad is going to happen to you? | yes | no |
| 7. Do you feel happy most of the time? | yes | no |
| 8. Do you often feel helpless? | yes | no |
| 9. Do you prefer to stay at home, rather than going out and doing things? | yes | no |
| 10. Do you feel that you have more problems with memory than most? | yes | no |
| 11. Do you think it is wonderful to be alive now? | yes | no |
| 12. Do you feel worthless the way you are now? | yes | no |
| 13. Do you feel full of energy? | yes | no |
| 14. Do you feel that your situation is hopeless? | yes | no |
| 15. Do you think that most people are better off than you are? | yes | no |

Total Score _____

Geriatric Depression Scale



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Diagnostic Tools

SEVERITY

- Dementia severity rating scale (DSRS)
- Global Deterioration Scale (GDS)
- Clinical Dementia Rating Scale (CDR)
- Functional Assessment Staging Test (FAST)

NEUROPSYCHIATRIC SYMPTOMS

- Neuropsychiatric inventory (NPI)
- Dementia Signs and Symptoms Scale (DSS)

Diagnostic Tools

FAST Test

- Hospice assessment at 7A

Functional Assessment Scale (FAST)	
1	No difficulty either subjectively or objectively.
2	Complains of forgetting location of objects. Subjective work difficulties.
3	Decreased job functioning evident to co-workers. Difficulty in traveling to new locations. Decreased organizational capacity. *
4	Decreased ability to perform complex task, (e.g., planning dinner for guests, handling personal finances, such as forgetting to pay bills, etc.)
5	Requires assistance in choosing proper clothing to wear for the day, season or occasion, (e.g. pt may wear the same clothing repeatedly, unless supervised.*
6	Occasionally or more frequently over the past weeks. * for the following A) Improperly putting on clothes without assistance or cueing . B) Unable to bathe properly (not able to choose proper water temp) C) Inability to handle mechanics of toileting (e.g., forget to flush the toilet, does not wipe properly or properly dispose of toilet tissue) D) Urinary incontinence E) Fecal incontinence
7	A)Ability to speak limited to approximately ≤ 6 intelligible different words in the course of an average day or in the course of an intensive interview. B) Speech ability is limited to the use of a single intelligible word in an average day or in the course of an intensive interview C) Ambulatory ability is lost (cannot walk without personal assistance.) D) Cannot sit up without assistance (e.g., the individual will fall over if there are not lateral rests [arms] on the chair.) E) Loss of ability to smile. F) Loss of ability to hold up head independently.
*Scored primarily on information obtained from a knowledgeable informant. Psychopharmacology Bulletin, 1988 24:653-659.	



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Diagnosis

Normal Aging

- Subjective memory complaints
- Normal cognitive assessment

Mild Cognitive Impairment

- Abnormal cognitive assessment
- No functional impairment

Dementia

- Abnormal cognitive assessment
- Functional impairment



Diagnosis

DSM V Criteria

- Evidence of significant cognitive decline from a previous level of performance in one or more cognitive domains. (learning and memory, language, executive function, complex attention, perceptual-motor, social cognition)
- The cognitive deficits interfere with independence in everyday activities.
- The cognitive deficits do not occur exclusively in the context of a delirium.
- The cognitive deficits are not better explained by another mental disorder

Diagnosis

- Labs:
 - TSH
 - B12
 - CBC
 - CCP
- Imaging:
 - MRI brain w/o contrast vs CT head
 - Amyloid PET scan
 - DAT scan
- Other:
 - LP
 - Infectious workup (syphilis, etc)

Diagnosis

- MRI: white matter hyperintensities
- 7,547 people age 35-69 w/o cardiovascular disease
 - Statistically significant cognitive decline with high white matter hyperintensities

Diagnosis

- Amyloid PET scan
 - + can indicate increased risk of developing dementia, but not always
 - Rule out AD if negative
 - Not useful to predict dementia in MCI
 - \$\$\$\$
- LP for $A\beta$ 1-42/1-40 ratio
 - May be helpful in predicting MCI progression to AD in 3 yr
 - Rule out AD if negative

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Prevention

Dementia prevention, in the *Lancet* Commission

Gill Livingston, Jonathan Huntley, Andrew Sommerlad, Davi Jiska Cohen-Mansfield, Claudia Cooper, Sergi G Costafreda, A Eric B Larson, Adesola Ogunniyi, Vasiliki Orgeta, Karen Ritchie Geir Selbæk, Linda Teri, Naaheed Mukadam

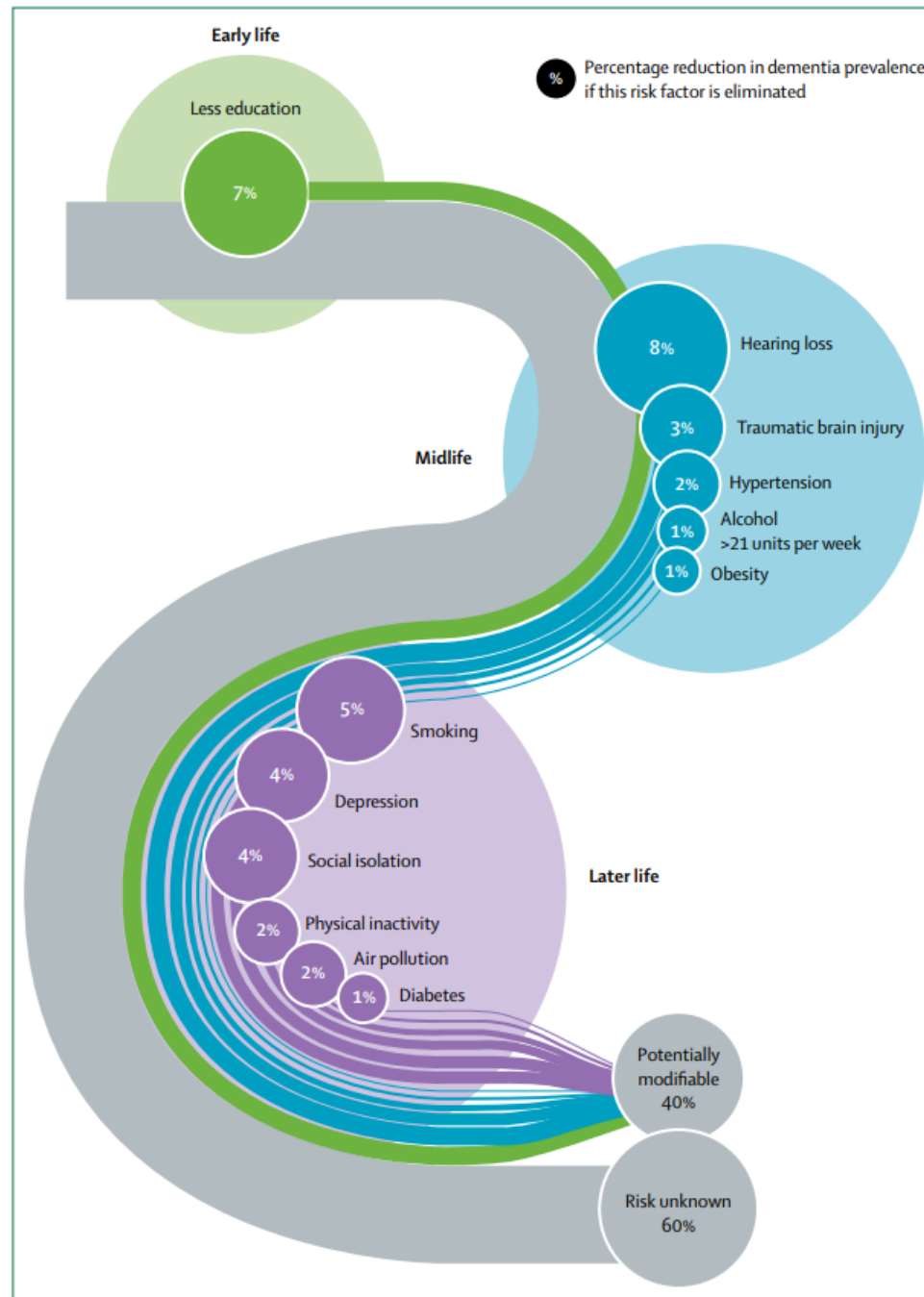


Figure 7: Population attributable fraction of potentially modifiable risk factors for dementia



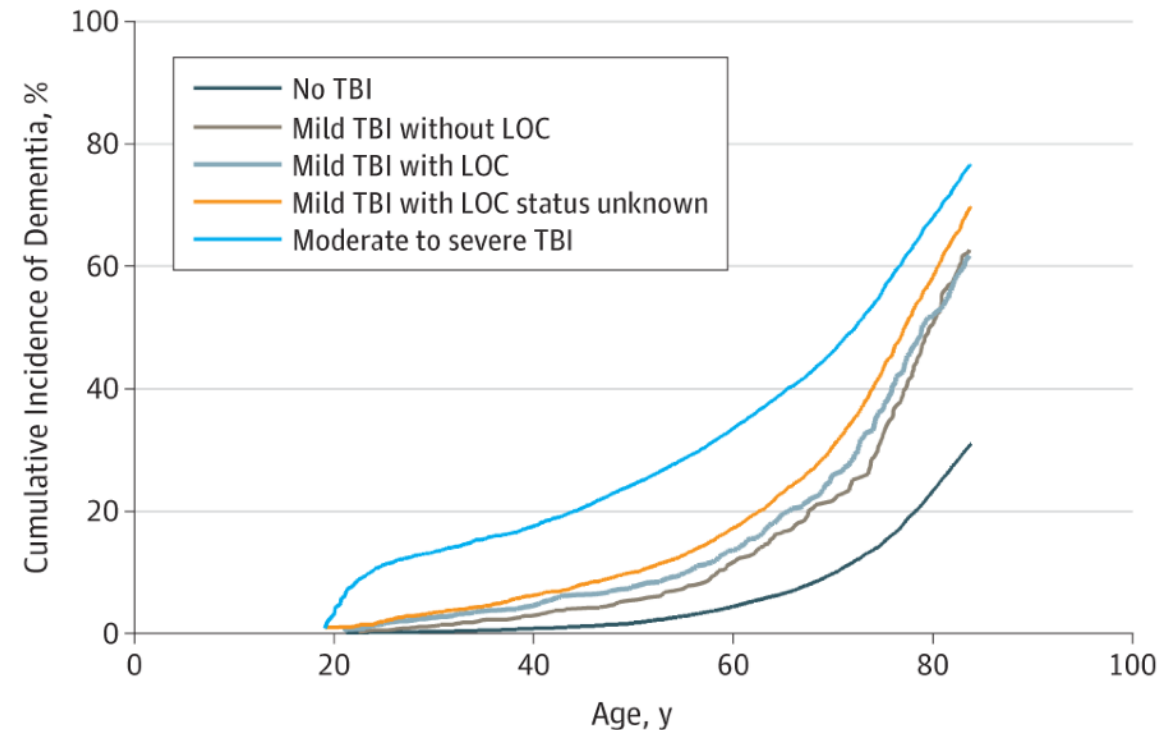
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Prevention – Hearing Loss

- Subclinical hearing loss is associated with decreased cognition.
- Self-reported hearing problems indicated a statistically significant correlation between disability in ADLs ($p=0.0046$) and dementia ($p=0.0238$)
- Wearing hearing aids improved their risk to that of individuals reporting no hearing impairment. No increased risk of either dementia or disability in ADLs.

Prevention – Traumatic Brain Injury

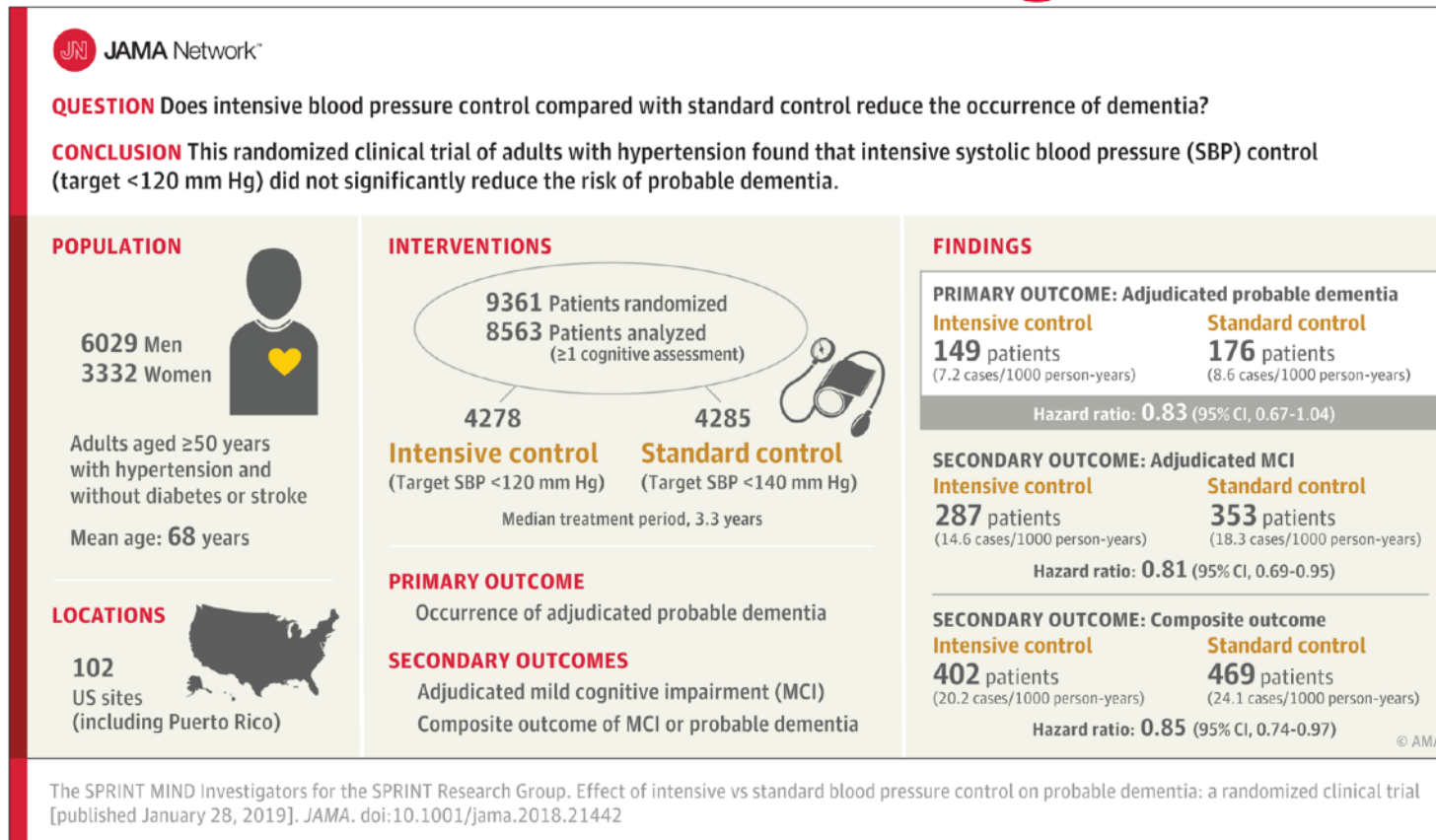
- 178,779 veterans with TBI compared to those without.
- Dementia is associated with TBI severity
- HR 2.36 for mild TBI
- HR 2.51 for mild TBI w/ LOC
- HR 3.19 for mod-severe TBI



JAMA Neurol. 2018;75(9):1055-1061. doi:10.1001/jamaneurol.2018.0815

Prevention - Hypertension

SPRINT-MIND Trial



Prevention - Exercise

- HUNT study 2017
 - 28,916 participants 30-60 yo followed 25 yr
 - Moderate-vigorous physical activity (breaking into sweat) was associated with decreased dementia risk (HR 0.8)
- Swedish 44 year study 2018
 - High peak fitness associated with decreased dementia risk vs low and medium.
- Meta-Analysis 2019 404,840 participants; self reported physical activity**
 - Inactivity 10 years prior to diagnosis associated
 - Inactivity 10-15 years prior to diagnosis not associated

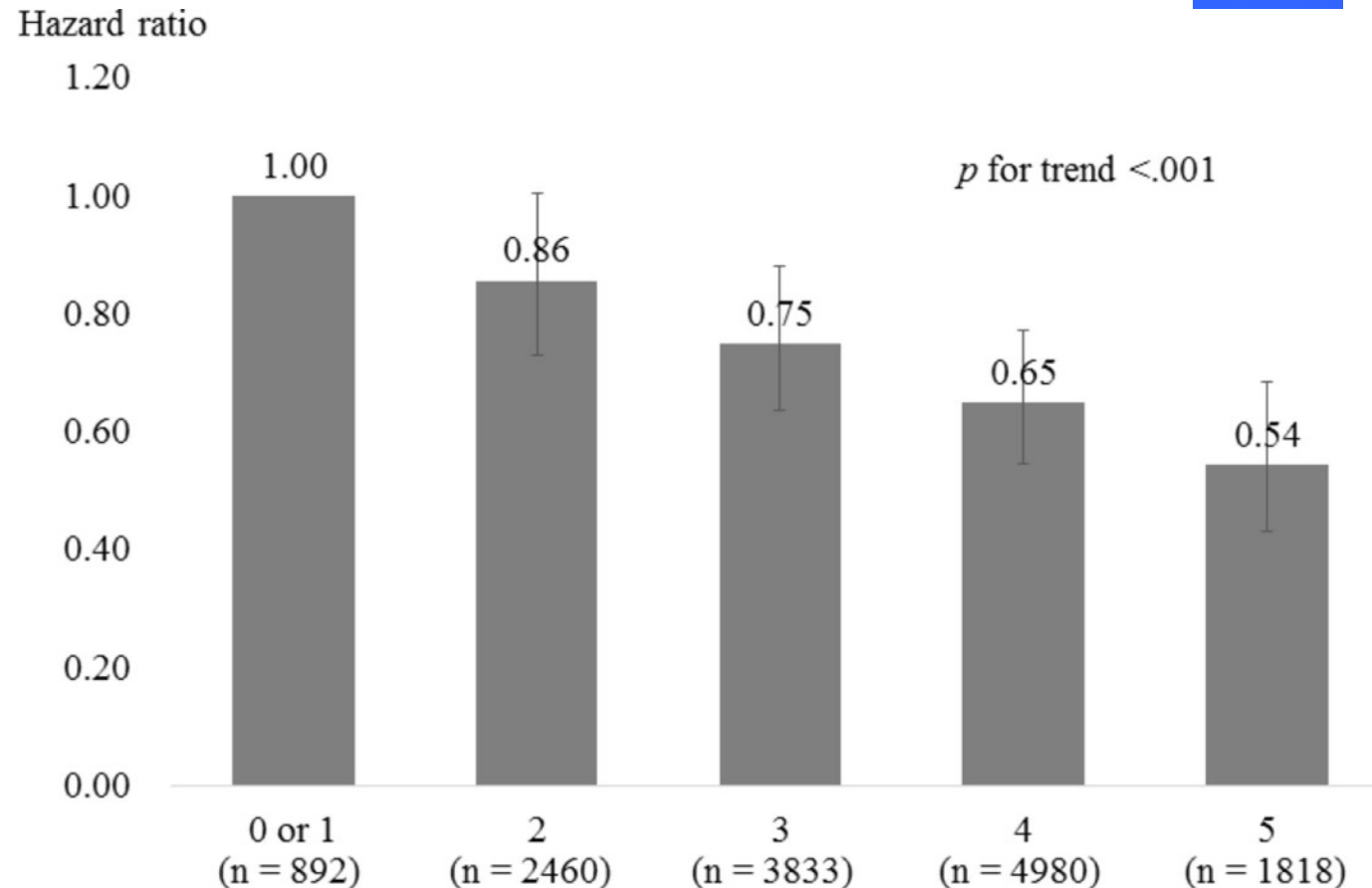
Prevention - Socialization

- 2019 Systematic review and meta-analysis

- 102,035 participants
- High social contact (social activity and social network) was associated with better late-life cognitive function

- 2018 prospective cohort study Japan

- 13,984 community-dwelling 65yo+
- married, contact with friends, group participation, work engagement and social support exchanges with family



Prevention - Diet

- Mediterranean diet
 - May improve global cognition, but did not seem to reduce incident of cognitive impairment or dementia
 - WHO recommends this
- Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND Diet)
 - May slow cognitive decline
 - May reduce incidence of Alzheimer's Dementia

Prevention

- No evidence supporting:
 - Statins
 - ASA
 - Supplements
 - Vitamins A, B, C, D, and E
 - Calcium, zinc, copper, MV, n-3 fatty acids, antioxidant vitamins and herbs
- Prevagen:
 - 10 mg apoaequorin (synthetic protein originally from jellyfish), 50 mcg Vitamin D.
 - \$\$\$\$
 - Sponsored study showing benefit in people with normal memory or mild subjective impairment.

Treatment - MCI

10-15% yearly risk of progression to dementia

Prevention of progression

- Donepezil – No
- Rivastigmine - No
- Ginkgo Biloba – No
- Vitamin E – No
- Omega 3 – No
- B vitamins - No

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Treatment

- Discuss goals of care and adjust expectations
- Discuss Quality vs Quantity of life
- Discuss safety
- Stabilize the disease
- Assess care-partner and/or care-giver needs
- Advanced care planning
- Symptom Management

Treatment

- Hobbies
- Physical Activity
- Mental Stimulation

Treatment

- Acetylcholinesterase inhibitors: Donepezil, Galantamine, Rivastigmine.
 - Small, but measurable benefits
 - Mild-moderate disease benefits more than severe disease
- SE
 - First degree AV block
 - Prolonged QT
 - N, V, D, weight loss
 - Transdermal - rash, swelling, site irritation

Treatment

- N-methyl-D-aspartate (NMDA) receptor antagonist (Memantine)
 - Moderate to severe disease stability without measurable clinical benefit
- SE
 - Confusion, dizziness, headache
 - Agitation, delusions, hallucinations

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Aducanumab

- Recombinant monoclonal antibody directed against amyloid beta
- Accelerated approval by the FDA June 2021
- Approved for:
 - Mild Cognitive Impairment or Mild Dementia
 - Documented amyloid pathology
 - No increased hemorrhage risk (anticoagulants, prior hemorrhage, microhemorrhages on MRI, etc.)
- IV q4 weeks w/ gradually increasing dose (7 increases)
- Monitoring:
 - MRI before initiation, dose 5, 7 and 12
- SE: 40% of patients experience ARIA; greater risk in APOE ϵ 4 carriers

Aducanumab

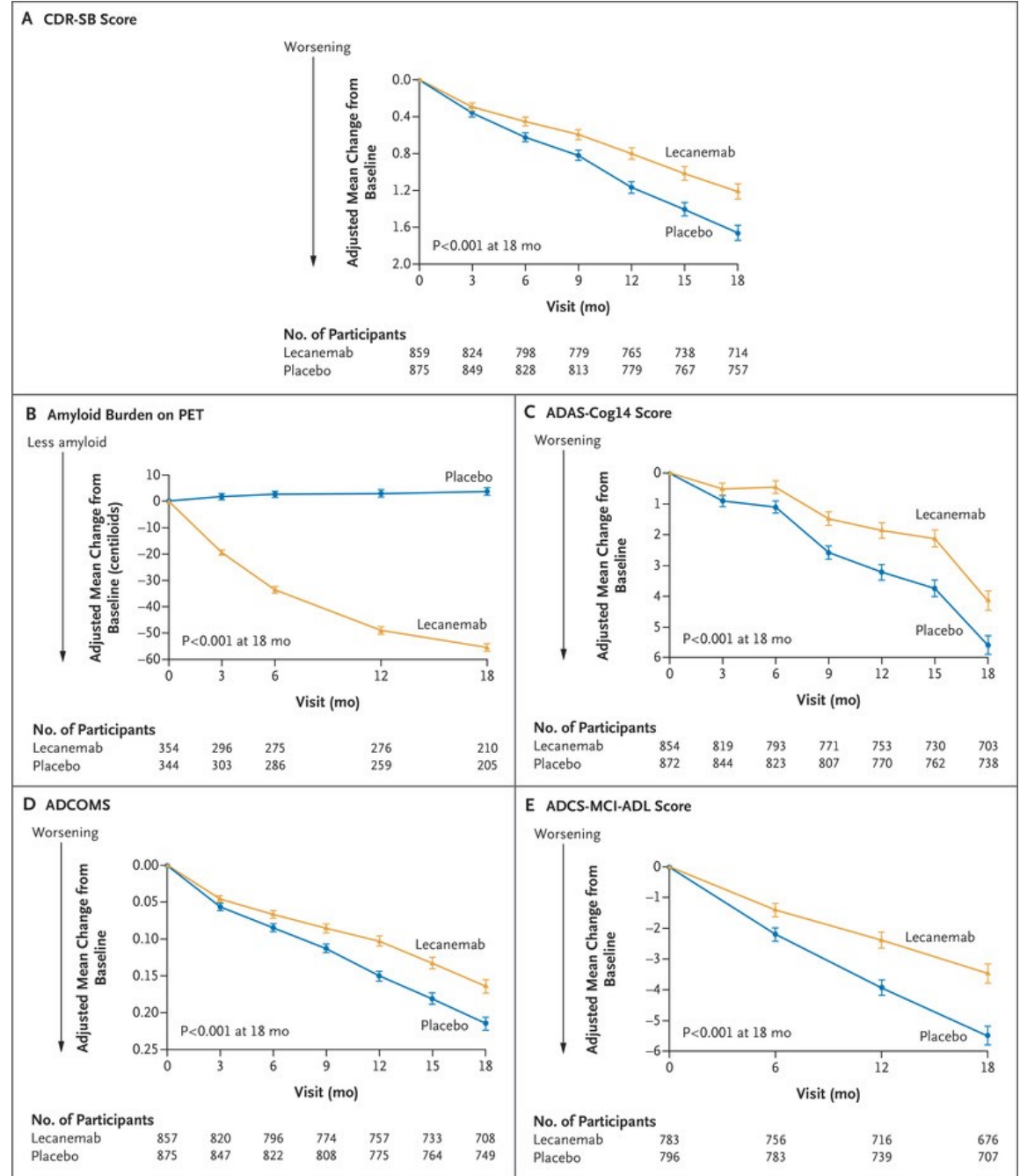
- EMERGE
 - 22% relative reduction in decline in high dose aducanumab (measured by CDR-SB)
 - Absolute reduction was 0.39
- ENGAGE
 - No difference in placebo vs high dose aducanumab (measured by CDR-SB)
- Both studies reduced plaque burden on amyloid PET (48% and 31%)

Lecanumab

- Anti-amyloid monoclonal antibody
- Accelerated approval in Jan 2023, Traditional approval in June 2023
- Approved for:
 - Mild Cognitive Impairment or Mild Dementia
 - Documented amyloid pathology (PET or LP)
 - No increased hemorrhage risk
- IV q2 weeks
- Monitoring
 - APOE ϵ 4 status testing prior to treatment
 - MRI brain prior to treatment (within 1 year), prior to 5th, 7th, and 14th infusions
- SE: 12.6% of ARIA-E, 17.3% ARIA-H

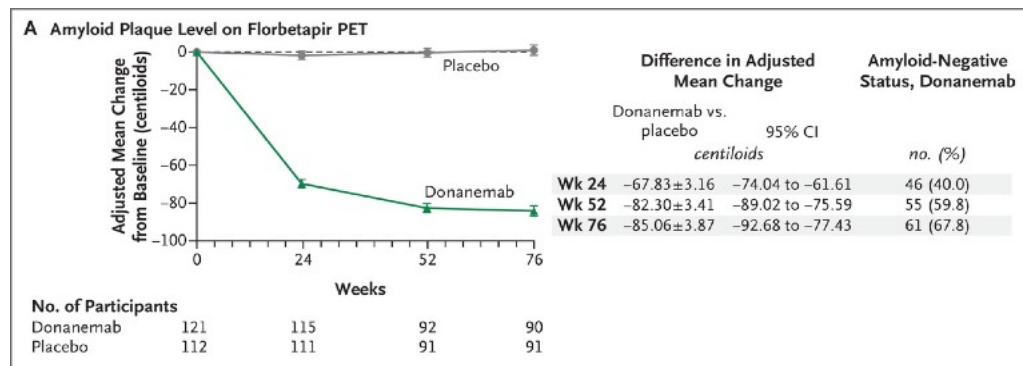
Lecanumab

- Absolute reduction of 0.45 point decline on CDR-SB over 18 months
- Reduction in amyloid plaque burden seen on PET

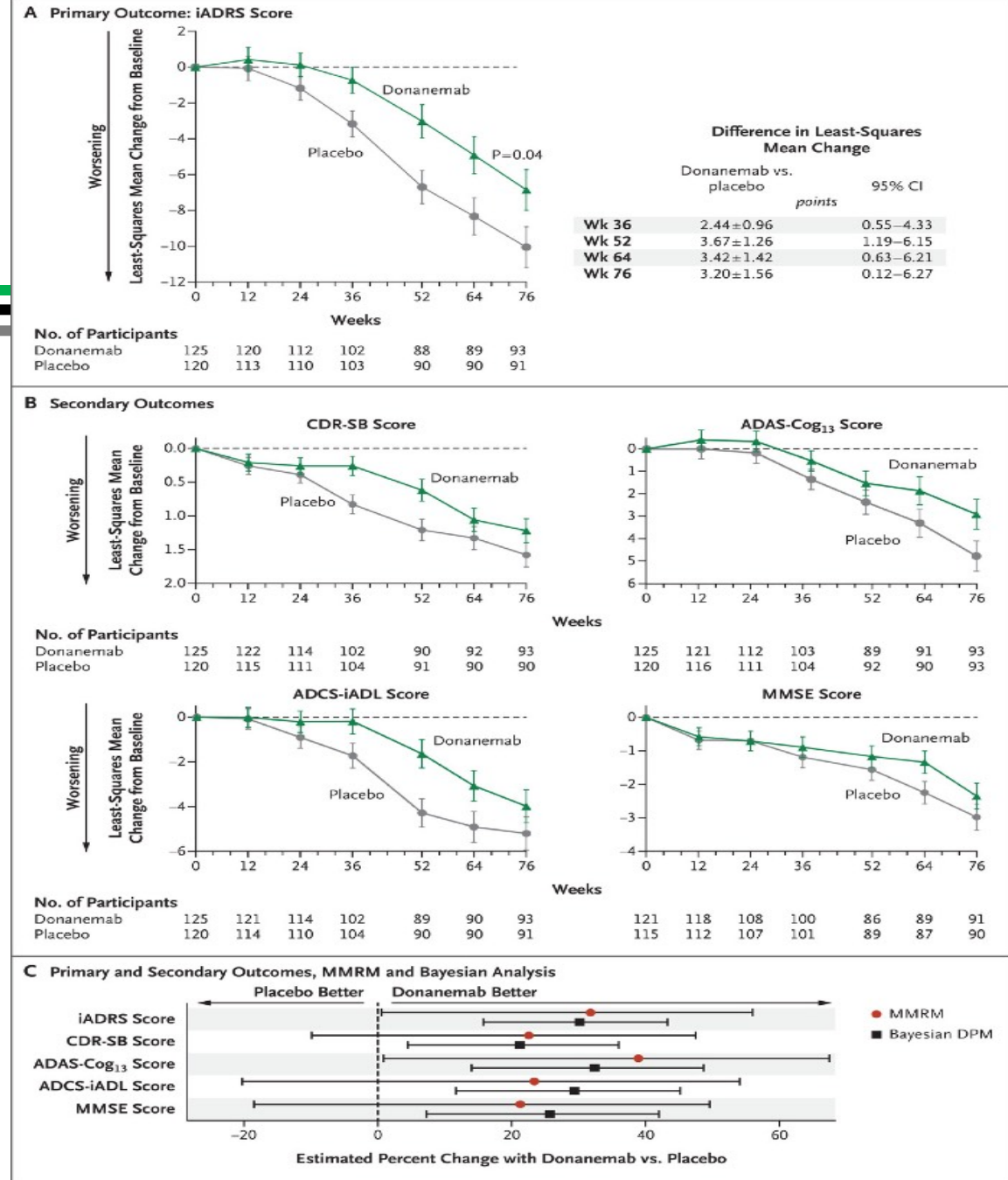


Donanemab

- Not FDA approved (yet?)
- IV q4week
- SE: 38.9% ARIA
- Did not meet aim to reduce progression of AD by half.
- CDR-SB absolute reduction of 0.36 (95% CI -0.83 to 0.12)



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Take Home Points

- Dementia = Functional impairment + Cognitive Impairment
- Rule out other causes: delirium, mood, medications, etc.
- Severity assessment is helpful in deciding treatment
- Fancy testing is not necessary
- Dementia prevention is better than treating (no cure)
- Support is often better than medications
- The risks of the new medications are significant and often > benefits

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