

Dementia and Mild Cognitive Impairment: An Overview

Mehul Trivedi, PhD,
Assistant Professor, Department of Psychiatry
SIU School of Medicine, Springfield, IL.

09.March.2023



SIU MEDICINE
FORWARD. FOR YOU.



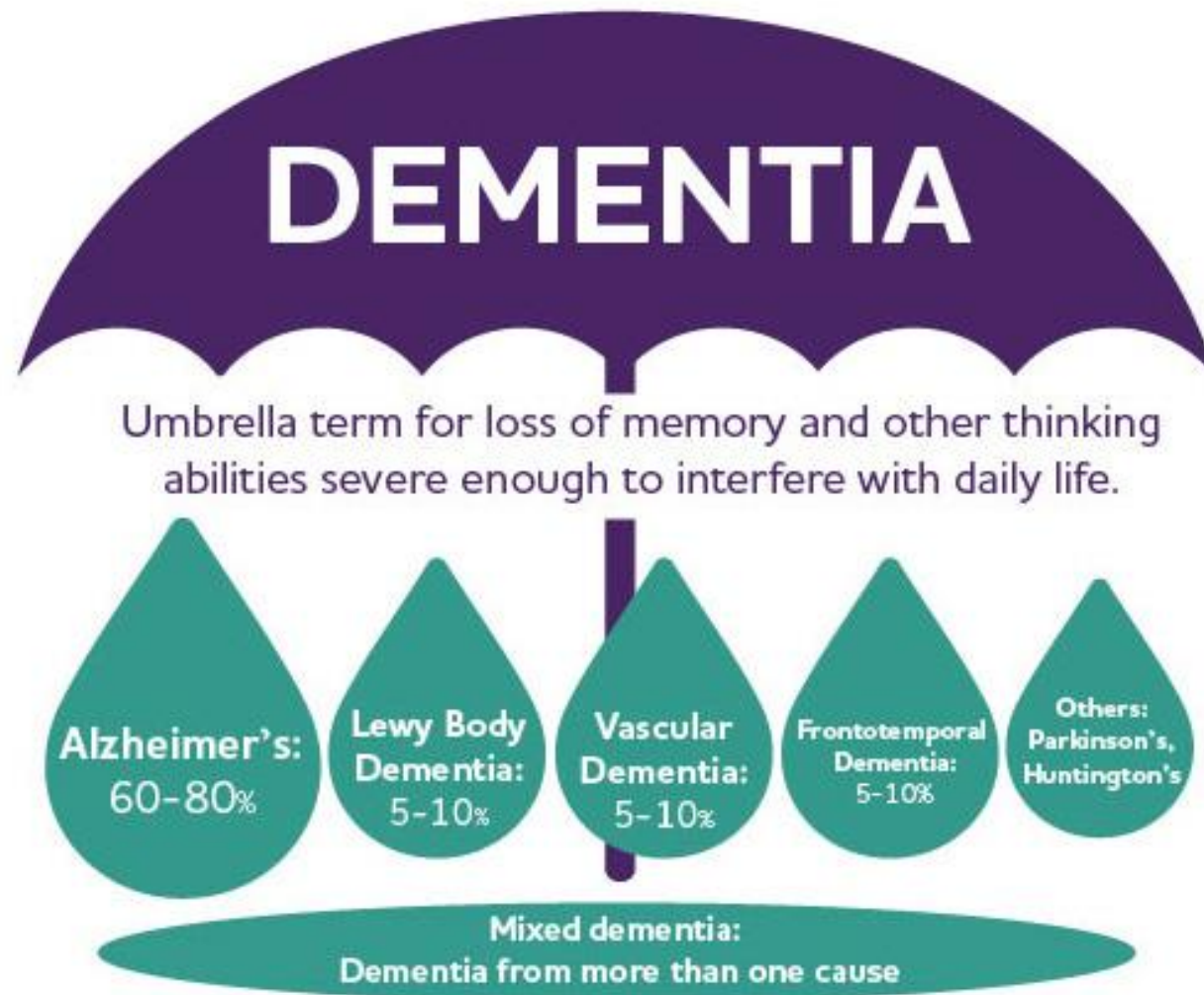
No Financial Disclosures



DEMENTIA

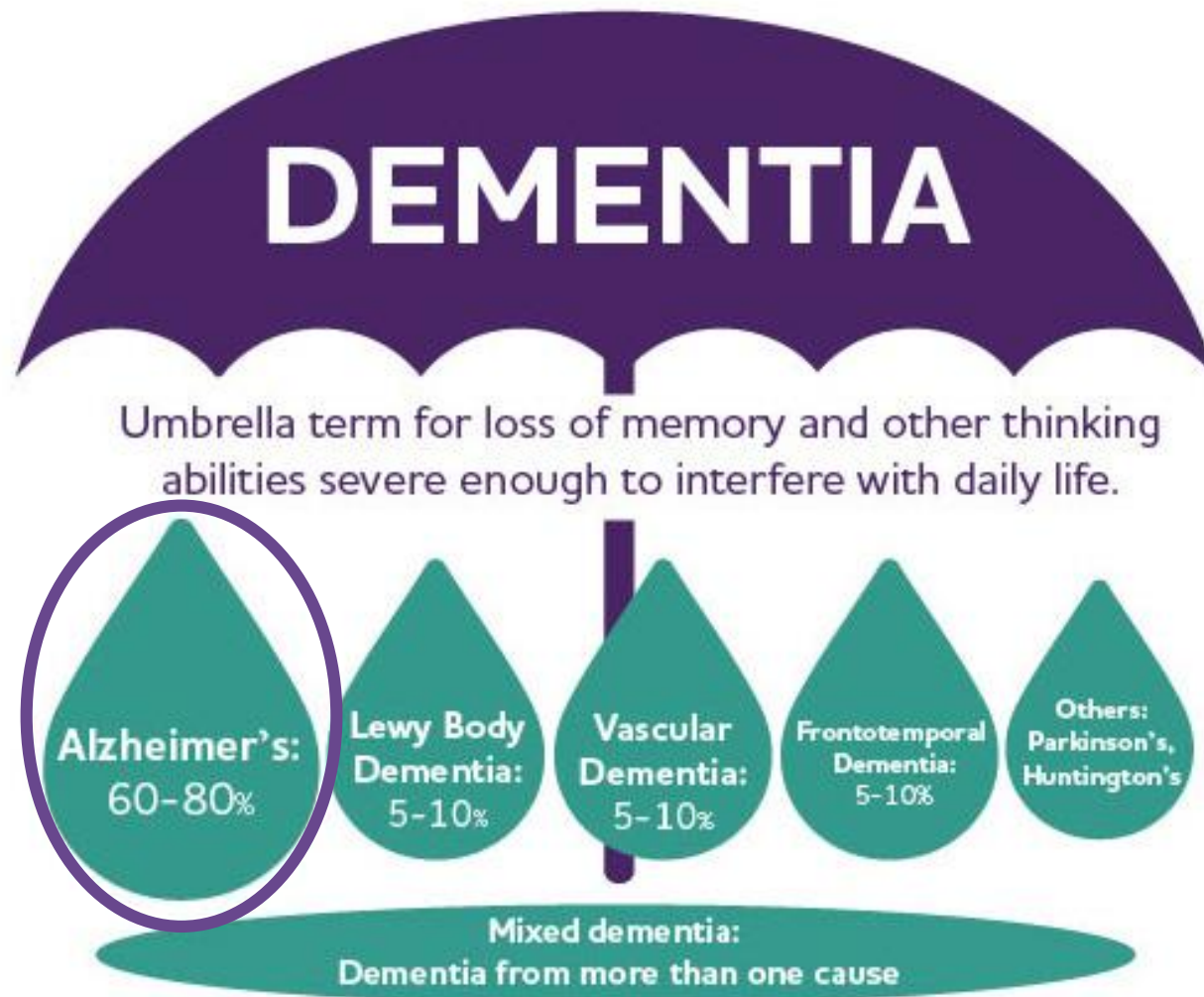
- **Dementia is a syndrome** in which there is deterioration in cognitive function beyond what might be expected from the types of cognitive changes that are observed in normal biological aging.
 - Dementia **is not a diagnosis or disease.**
 - Dementia represents a decline from a previous (premorbid) level of functioning.
 - Difficult to diagnosis in individuals with low premorbid functioning.
 - Intellectual disabilities.
 - Borderline intellectual functioning.
 - These declines are significant enough to interfere with daily living skills.
- Dementia primarily affects older adults over the age of 55.
- More than 55 million people live with dementia worldwide with nearly 10 million new cases every year.

DEMENTIA



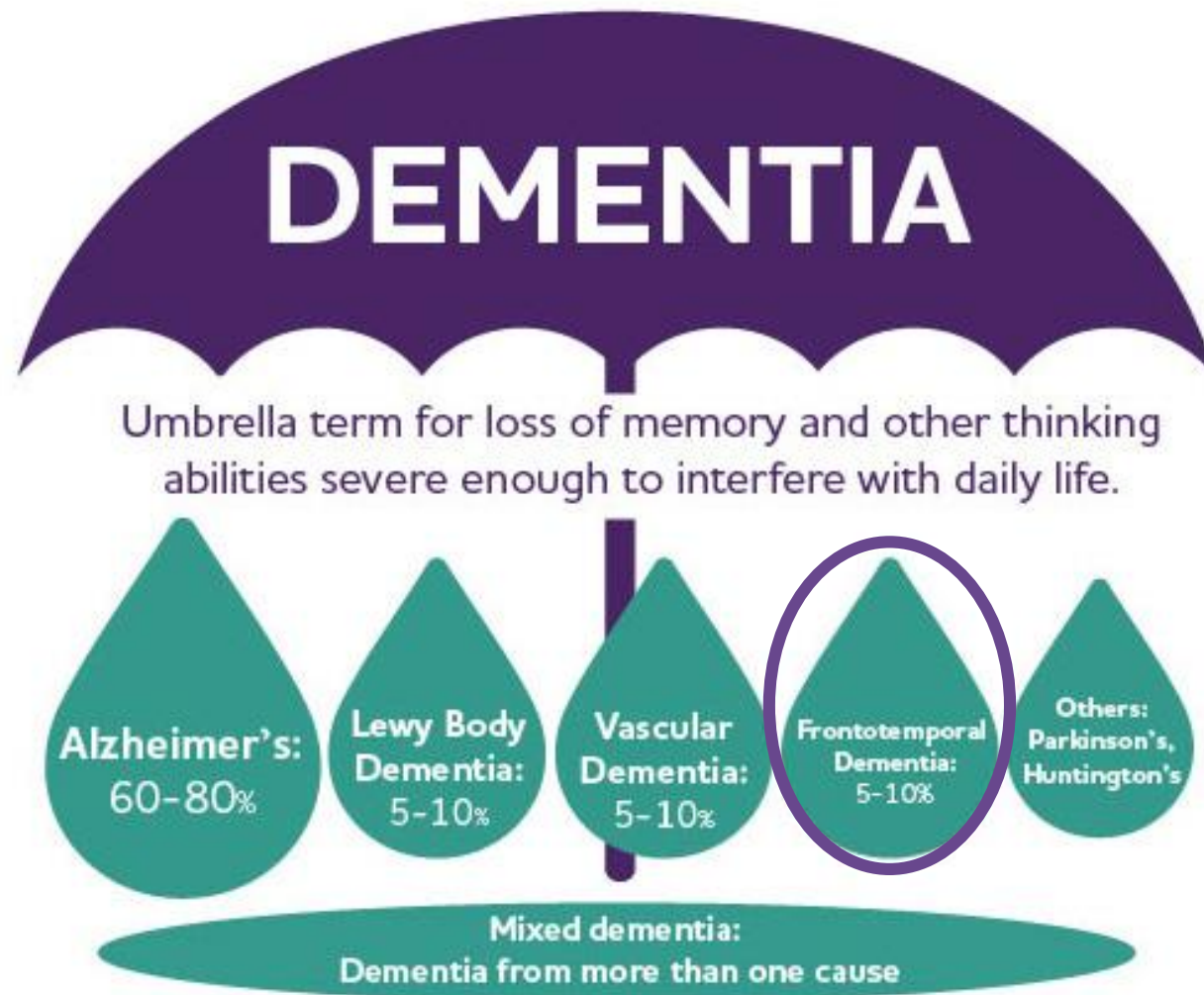
Also referred to as Major Neurocognitive Disorder in DSM-V-TR

DEMENTIA



Alzheimer's dementia is the most common form of dementia in older adults

DEMENTIA

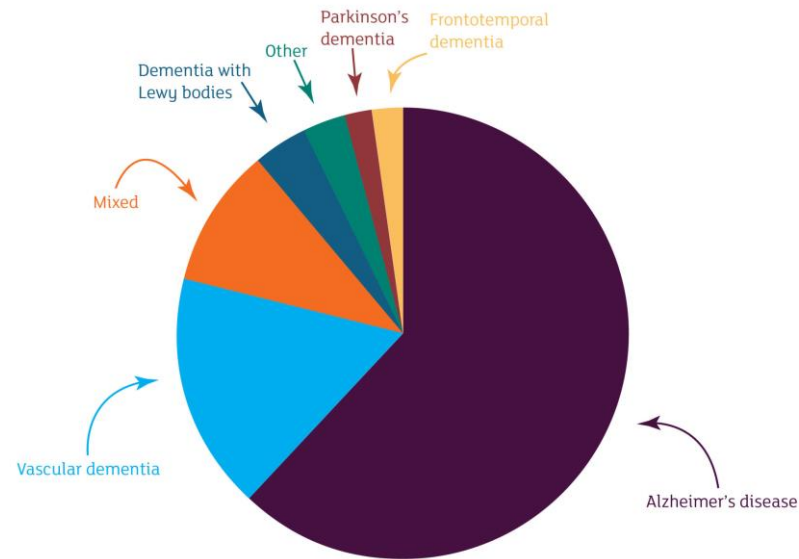


Frontotemporal dementia is most common form of early onset dementia

DEMENTIA

Prevalence rates of different etiologies for dementia.

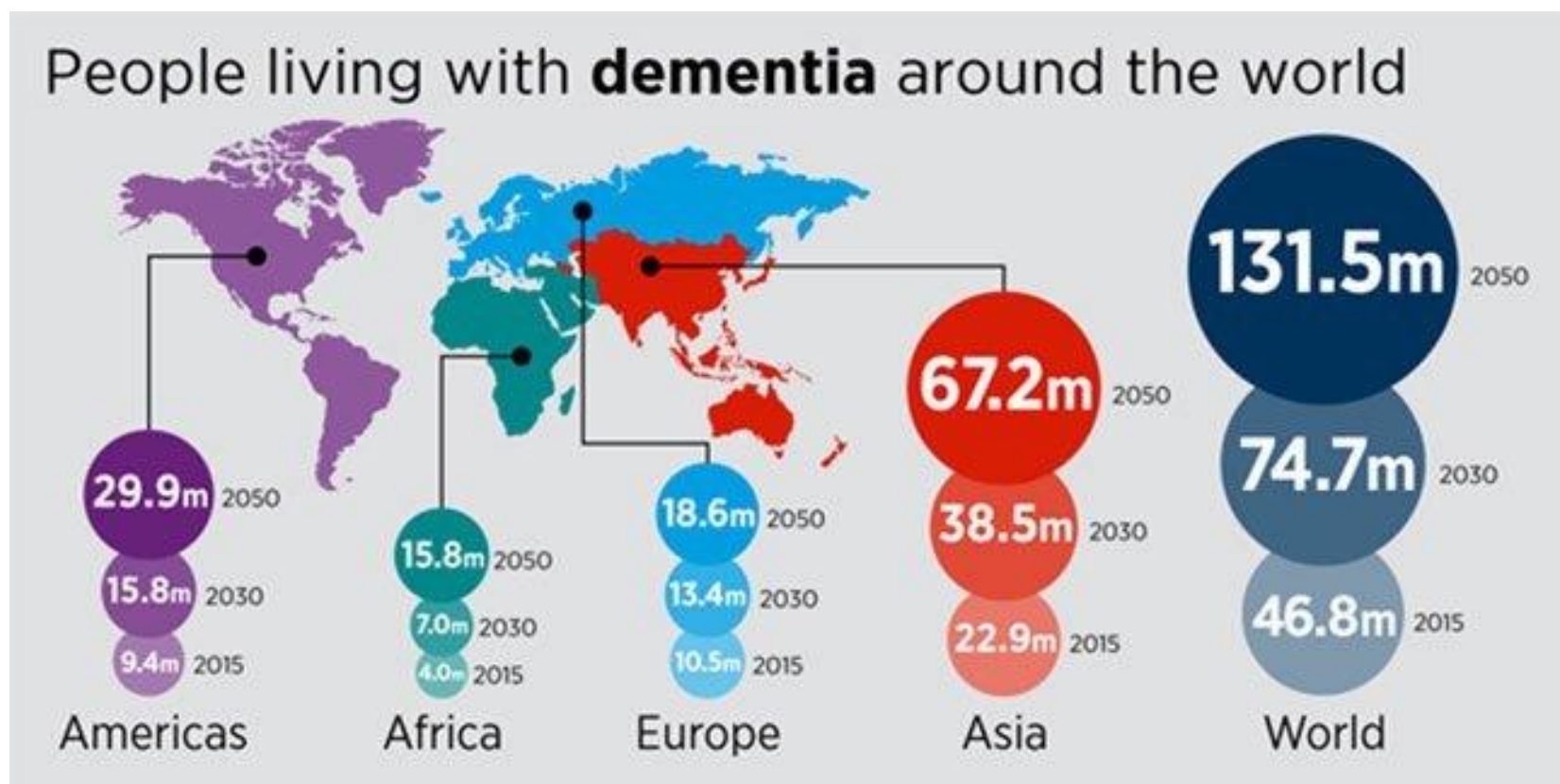
Causes of dementia



- In autopsy studies of individuals with AD, mixed pathologies are the **rule not the exception.**
- That is, Pure AD is rare on pathological examination.

DEMENTIA

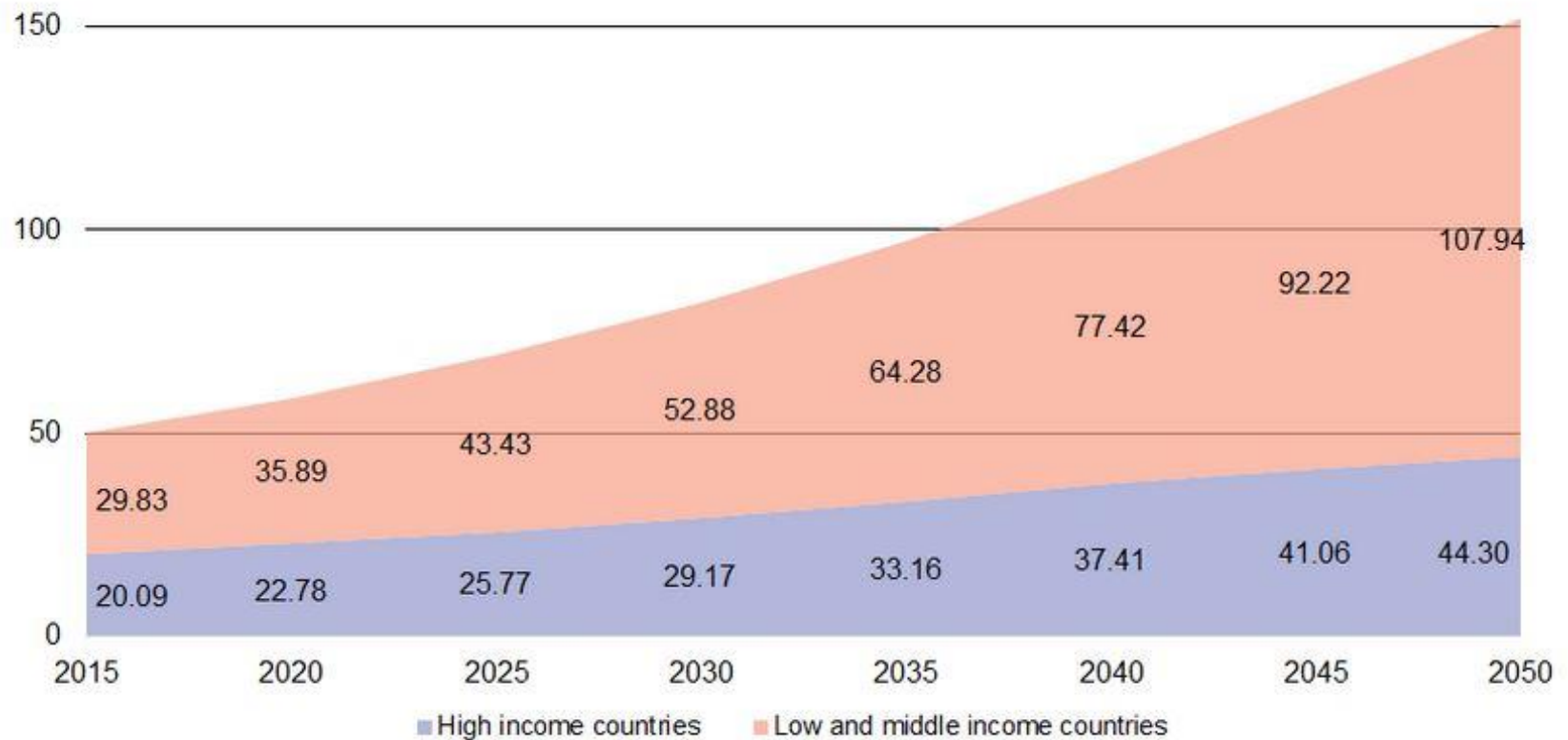
- Dementia is currently the seventh leading cause of death among all diseases and one of the major causes of disability and dependency among older people globally.



DEMENTIA

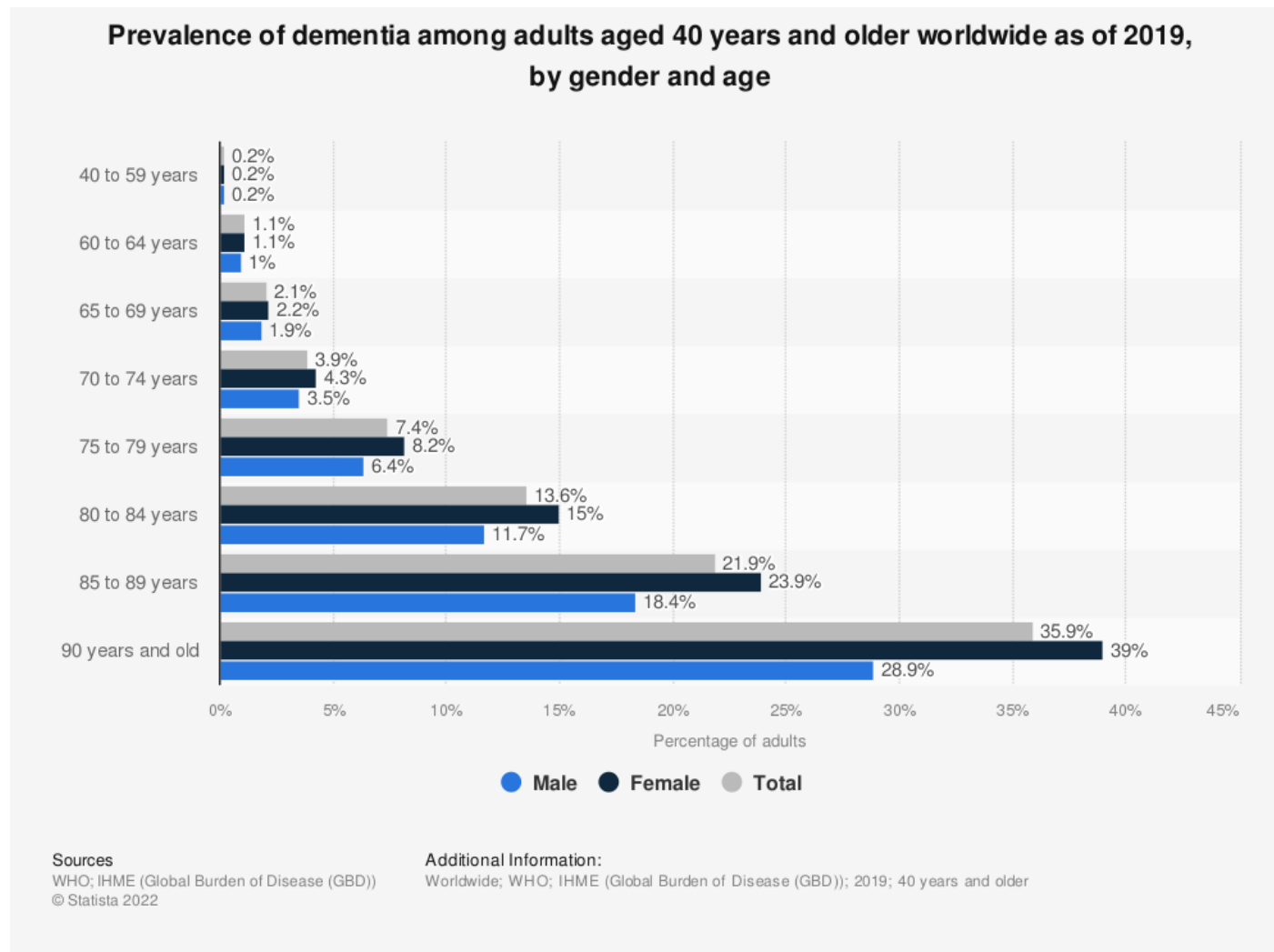
- Prevalence rates for dementia are greater in low and middle income countries than in high income countries.

Number of people with dementia (millions) in low and middle income countries compared to high income countries



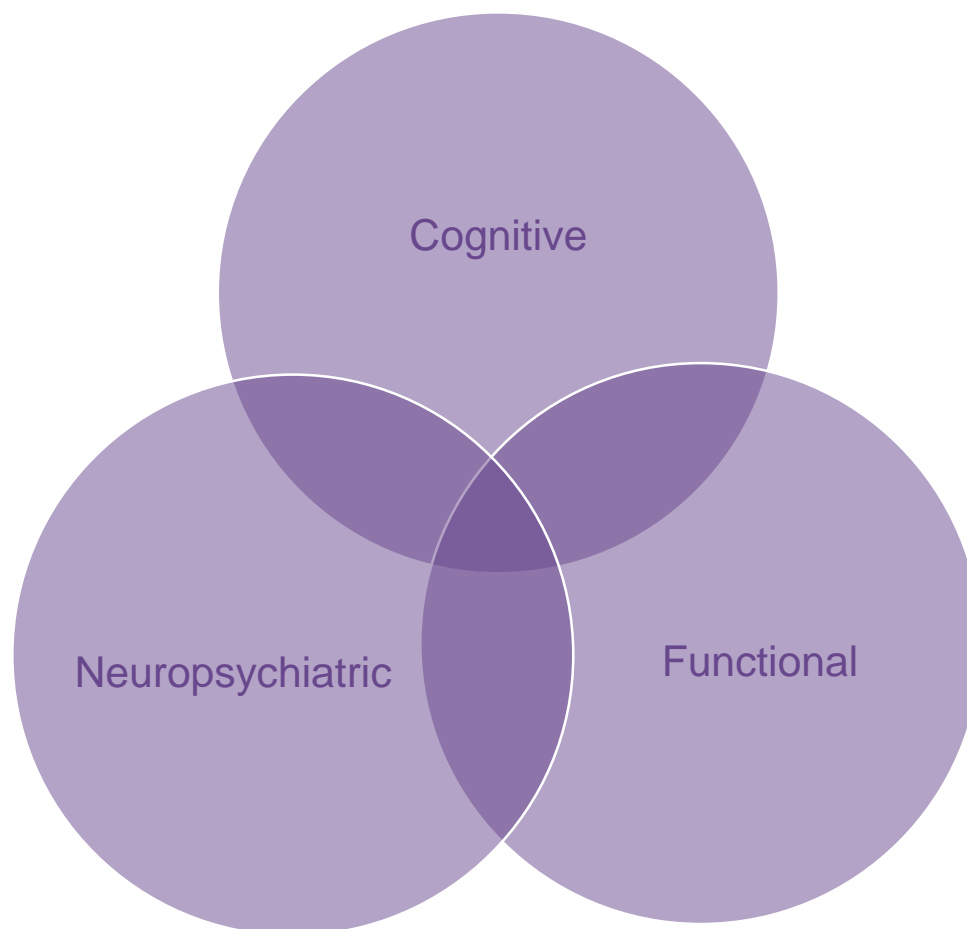
DEMENTIA

- Prevalence rates for dementia are greater in women compared to men.



SYMPTOMS

- Symptoms vary depending on the cause but can include the following: symptoms:



COGNITIVE CHANGES

- Memory loss, which is usually noticed by someone else.
- Communication and word finding problems.
- Visuospatial difficulties such as getting lost while driving.
- Difficulties with reasoning, problem-solving, handling complex tasks, and planning/organizing.
- Difficulty with coordination and motor functions.
- Confusion and disorientation.
- Difficulties with completing day-to-day activities such as managing finances, appointments, and household chores.

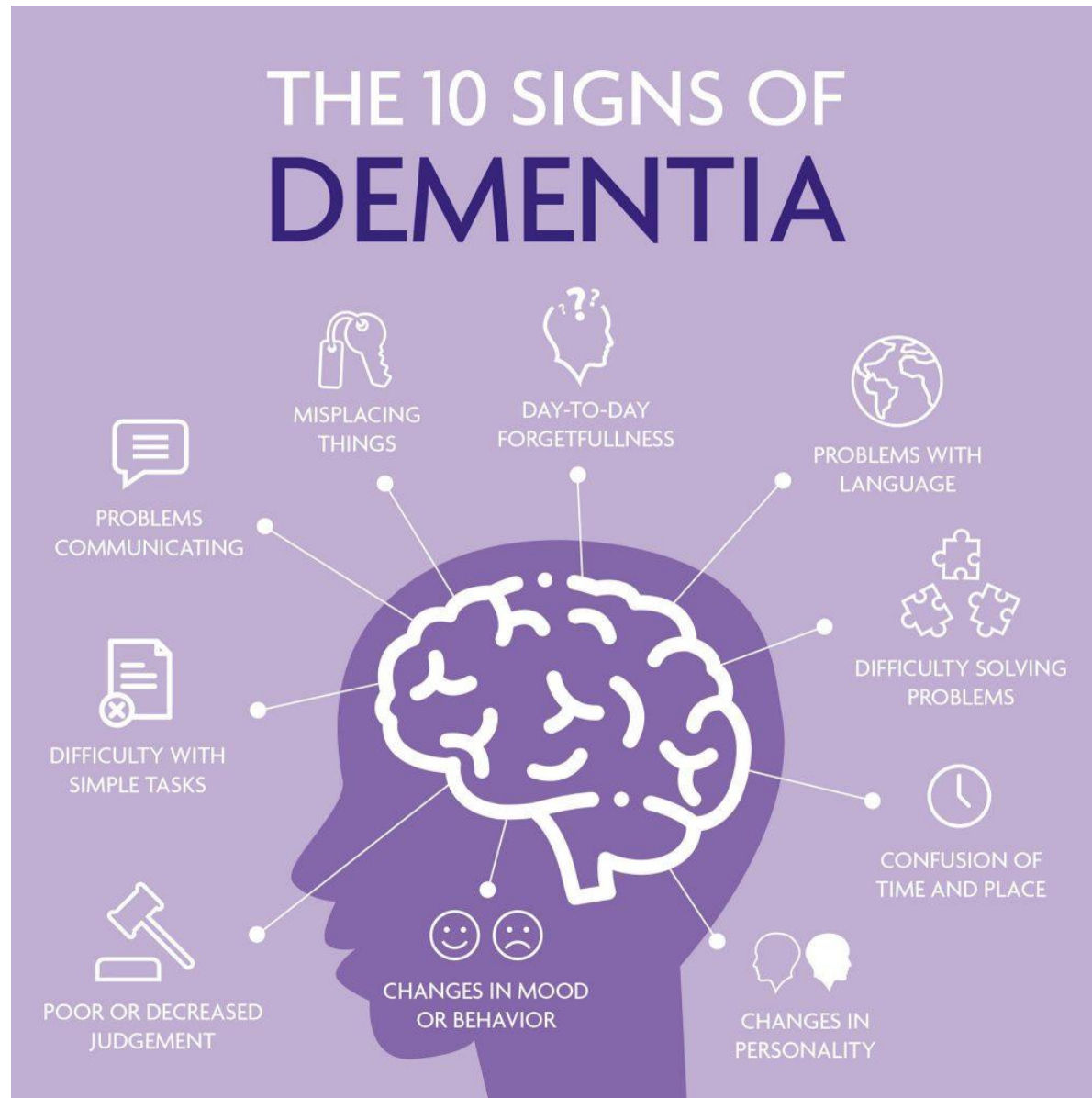


PSYCHOLOGICAL CHANGES

- Personality changes
- Depression
- Anxiety
- Inappropriate behavior
- Paranoia
- Agitation
- Hallucinations



SYMPTOMS



FIVE MOST COMMON PROGRESSIVE DEMENTIAS



5 Common Types of Dementia

Dementia is the broad term used to describe a number of different conditions affecting the brain



Alzheimer's Disease

One of the most common forms of dementia, Alzheimer's is an abnormal shrinkage of the brain that affects every brain function and causes significant changes, particularly in behaviour and interpersonal relationships.



Dementia with Lewy Bodies

Also known as "cortical Lewy body disease" or "diffuse Lewy body disease" it's similar to Alzheimer's in that it can cause tremors and stiffness. It may be accompanied with sleeping disorders and visual hallucinations.



Vascular Dementia

Also referred to as "multi-infarct dementia" or "post-stroke dementia," stroke or vascular accidents cause brain damage and tissue loss. Alzheimer-like symptoms can appear, such as memory disorders, bad decision making, and difficulty in planning.



Frontotemporal Dementia

When the neurodegeneration affects frontal and temporal lobes of the brain, it causes changes in behaviour and personality. It is marked by more emotional changes than cognitive impairment.



Mixed Dementia

When someone is affected by two types of dementia, such as Alzheimer's disease with vascular dementia, it is referred to as Mixed Dementia.

relish.

<https://relish-life.com/blog/dementia-types>


OTHER DISORDERS LINKED TO DEMENTIA



- Huntington's disease
 - Very strong genetic component with symptom onset typically between ages 30-50
 - Triad of symptoms: motor, cognitive, and psychiatric.

 - Traumatic Brain Injury
 - Dependent on number and severity of TBIs
 - No evidence to support a single mild TBI (concussion) resulting in dementia.
 - Chronic traumatic encephalopathy (CTE) is controversial.

 - Creutzfeldt-Jakob disease
 - Fatal neurodegenerative disorder caused by an abnormal type of protein (prion)
 - Most cases occur for unknown reasons.
 - Rapid deterioration over time (max time to death after diagnosis = 2.5 years).

 - Parkinson's disease
 - Approximately 30% of individuals with PD will develop dementia during the course of their illness.
 - Timing of onset of cognitive decline in relation to motor symptoms differentiates Dementia in PD from Lewy Body Dementia.
- 

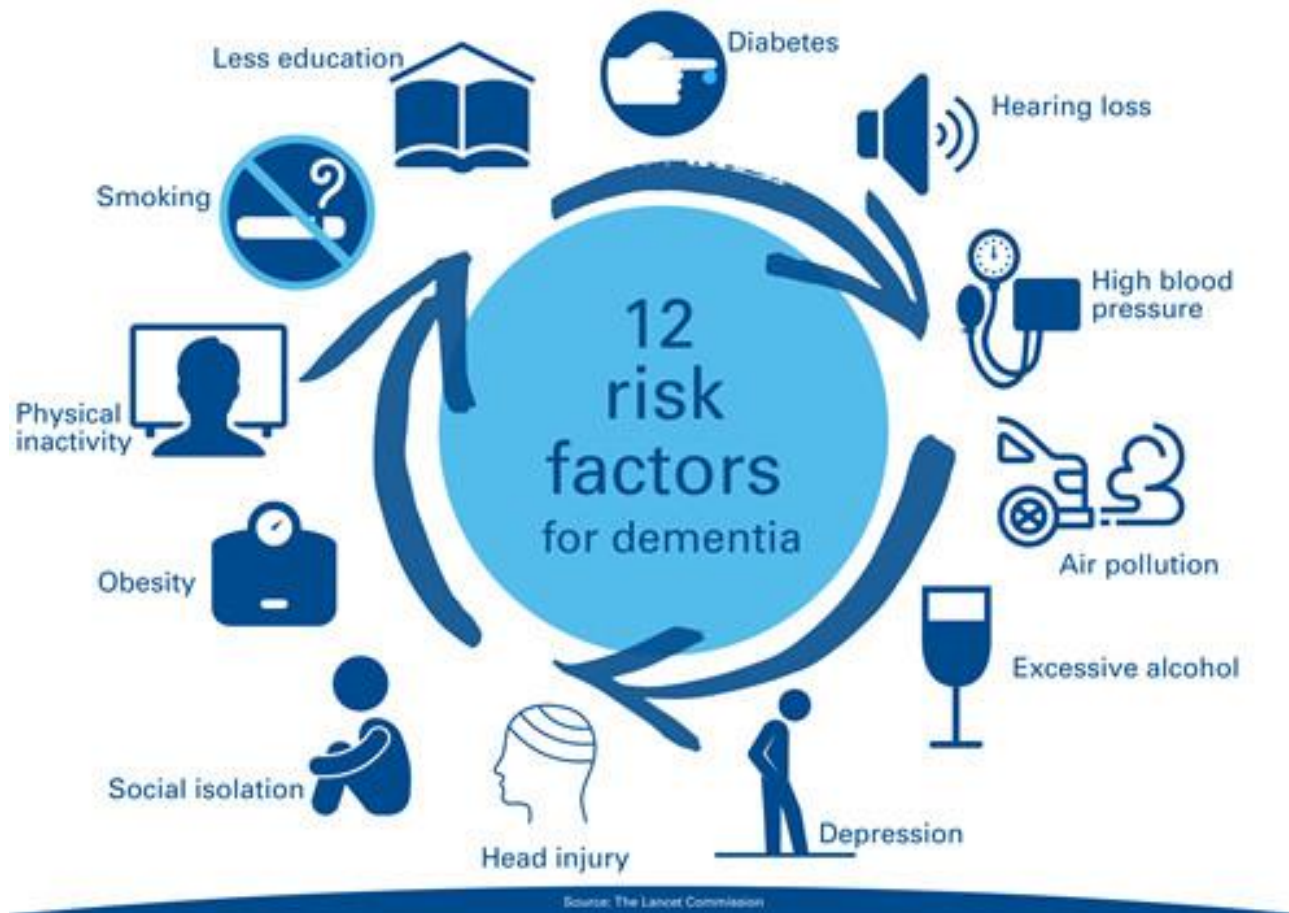


RISK FACTORS FOR ALL CAUSE DEMENTIA

- Nonmodifiable:
 - Age
 - Sex
 - Family history
 - Genetics
- 

RISK FACTORS FOR ALL CAUSE DEMENTIA

- Modifiable:



SUPPORT FOR MODIFIABLE DEMENTIA RISK FACTORS

Summary of the evidence on modifiable risk factors for cognitive decline and dementia: A population-based perspective

Matthew Baumgart^a, Heather M. Snyder^{b,*}, Maria C. Carrillo^b, Sam Fazio^c,
Hye Kim^a, Harry Johns^d

^aDivision of Public Policy, Alzheimer's Association, Washington, DC, USA

^bDivision of Medical & Scientific Relations, Alzheimer's Association, Chicago, IL, USA

^cDivision of Constituent Relations, Alzheimer's Association, Chicago, IL, USA

^dPresident & CEO, Alzheimer's Association, Chicago, IL, USA

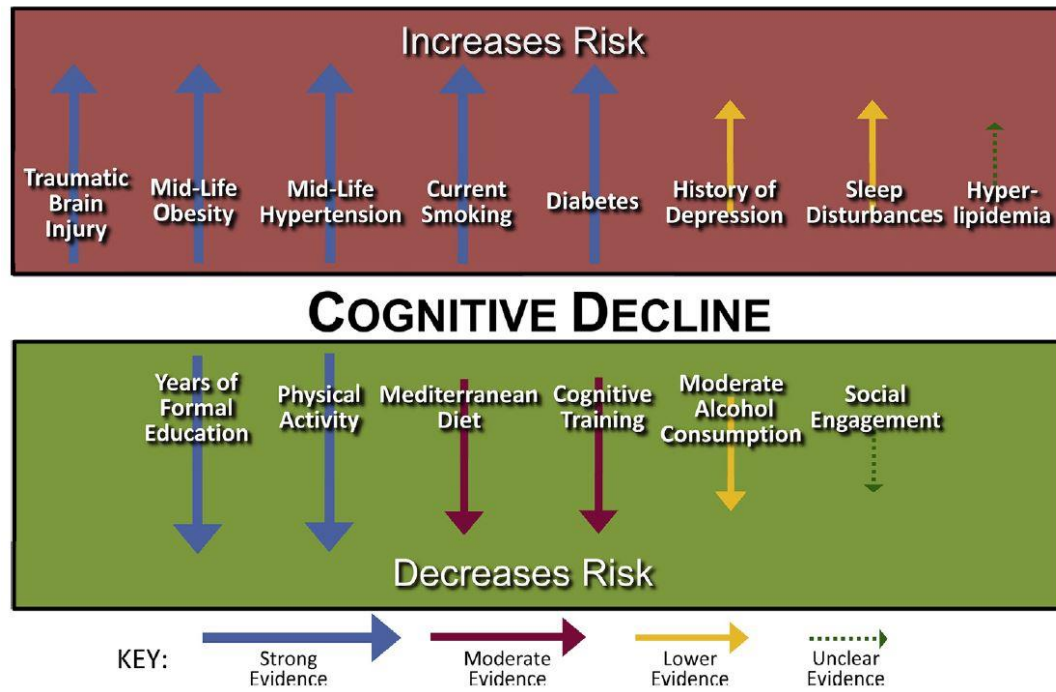


Fig. 1. Strength of evidence on risk factors for cognitive decline.



DIAGNOSTIC DECISION TREE FOR DEMENTIA


Does the patient have dementia?

- Is there an impairment in memory and/or other cognitive domains?
- Does it represent a decline from a previous level of functioning?
- Does it interfere with daily life?
- Differentiate from delirium, intoxication, intellectual disability, psychopathology, and malingering.

Does the patient have dementia alone or with some other comorbid condition(s)?

- Delirium, depression, substance abuse, medical conditions in addition to primary etiology
- Head trauma, substance abuse, anoxia as contributing factors

What is the etiology of the patient's dementia?

- Alzheimer's dementia
 - Vascular dementia
 - Lewy Body dementia
 - Mixed dementia
 - Frontotemporal dementia
- 

CHARACTERIZING SEVERITY OF DEMENTIA

- Severity of dementia symptoms can be characterized using various instruments:
 - Clinical Dementia Rating Scale Sum of Boxes (CDR-SB).
 - Clinician based instrument.
 - Based on a scale of 0-18.

Table 3. Sum of Boxes Staging Category

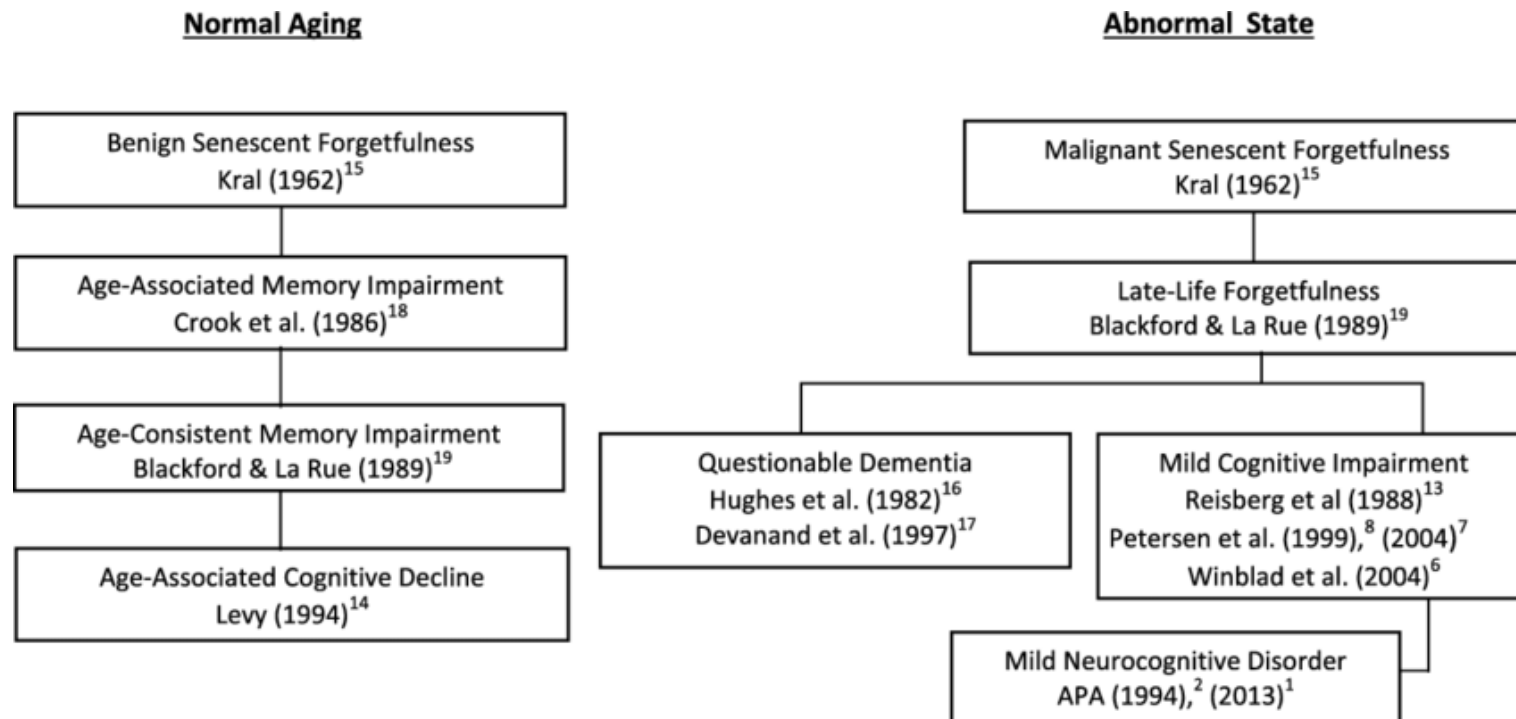
CDR Sum of Boxes Range	Staging Category
0	Normal
0.5-4.0	Questionable cognitive impairment
0.5-2.5	Questionable impairment
3.0-4.0	Very mild dementia
4.5-9.0	Mild dementia
9.5-15.5	Moderate dementia
16.0-18.0	Severe dementia

Abbreviation: See Table 1.

- Training available online at:
 - <https://knightadrc.wustl.edu/professionals-clinicians/cdr-dementia-staging-instrument/training-options/>

DEMENTIA AND MILD COGNITIVE IMPAIRMENT

- A variety of different terms have been used to describe normal age-related cognitive decline versus abnormal cognitive aging.



DEMENTIA AND MILD COGNITIVE IMPAIRMENT



- It is important to understand what normal cognitive aging looks like before one can understand what abnormal cognitive aging looks like.



MANY DEFINITIONS OF WHAT IS NORMAL

- Typical
- Standard
- Average
- Not deviating from a norm
- Natural
- In accordance with scientific laws
- Lacking abnormalities
- Not abnormal
- Occurring naturally, not because of disease
- Free from mental disorder
- Balanced, well-integrated functioning

WHAT DOES NORMAL COGNITIVE AGING LOOK LIKE?



Vulnerable Processes

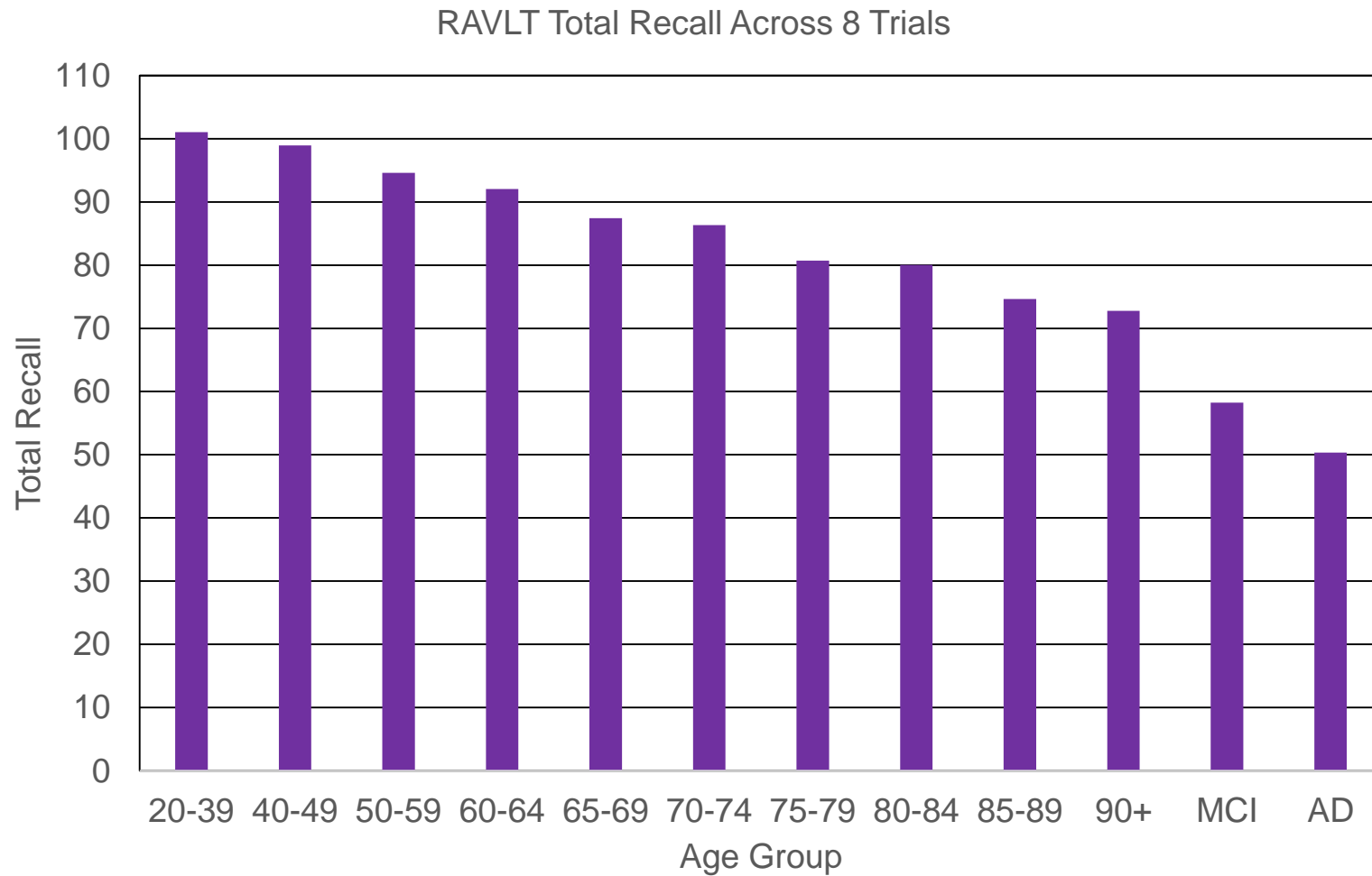
- Fluid IQ
- Reaction time
- Psychomotor speed
- Working memory
- Executive function
- Episodic learning/memory
- Complex visual processing

(Relatively) Preserved Processes

- Crystallized IQ
- Word reading
- Simple attention span
- Vocabulary
- Priming
- Semantic memory
- Procedural memory
- Long-term autobiographical memory.

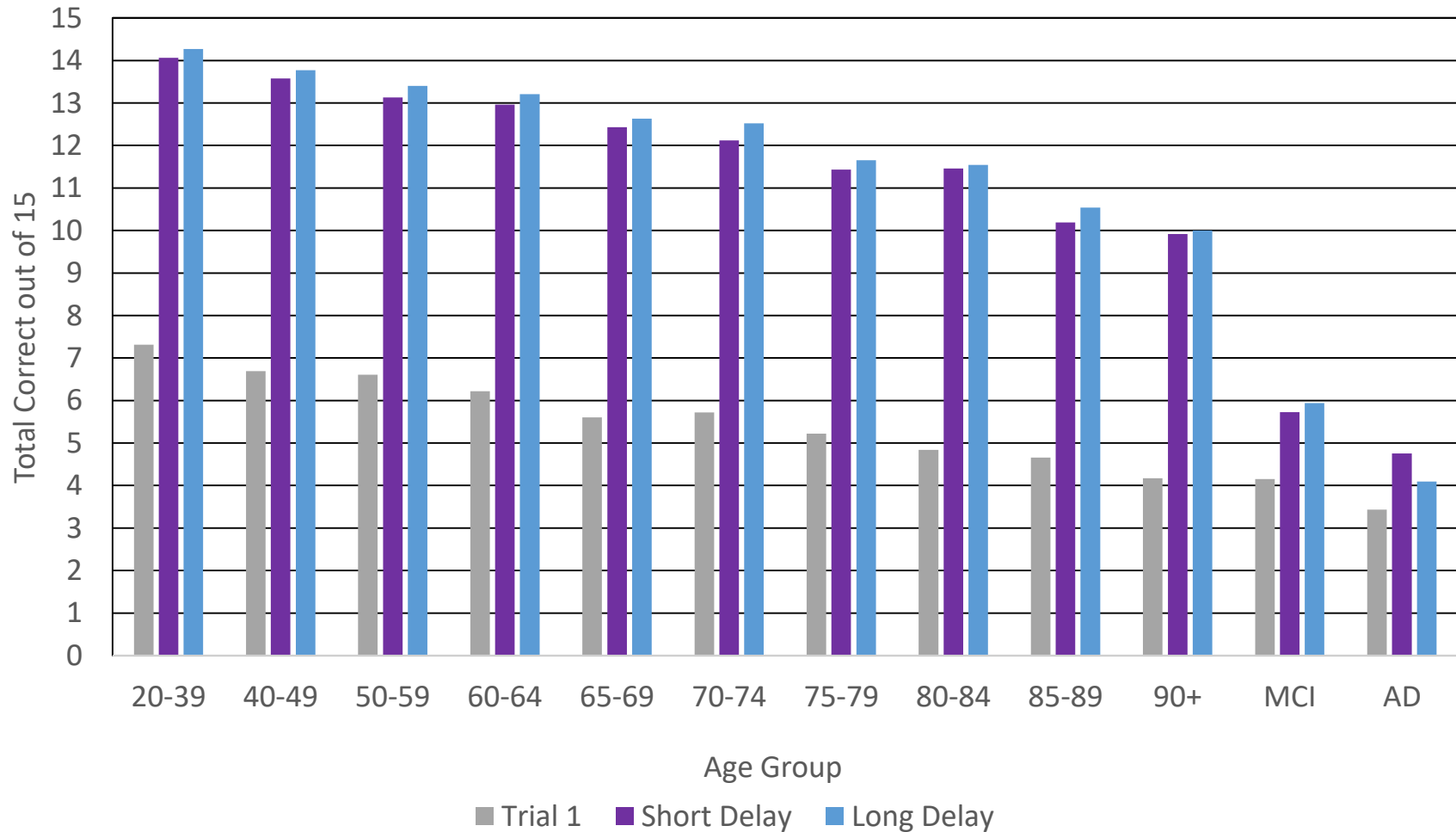


NORMAL AND ABNORMAL AGING EFFECTS ON A WORD LIST LEARNING/MEMORY TEST



AGING EFFECTS ON A WORD LIST LEARNING/MEMORY TEST (RAVLT)

RAVLT total words recalled after first trial, 5-minute delay, and 30 minute delay





MILD COGNITIVE IMPAIRMENT

- Thought to represent a transition phase between normal aging and dementia.
- An early, but abnormal, state of cognitive impairment.
- Original definition was primarily focused on identifying individuals with memory impairment who were at greater risk for developing Alzheimer's disease (AD)
 - 60-80% of all individuals diagnosed with MCI eventually decline to dementia.



MILD COGNITIVE IMPAIRMENT




- Neuropsychological testing is often critical for the accurate diagnosis of MCI and transition to dementia.
 - Neuropsychological measures are proxies to important functional deficits.
- The severity of deficits in memory and executive function correlate with declines in the ability to independently perform many instrumental daily living skills.
 - Managing finances, medications, and appointments.
 - Driving.





AMNESTIC MILD COGNITIVE IMPAIRMENT

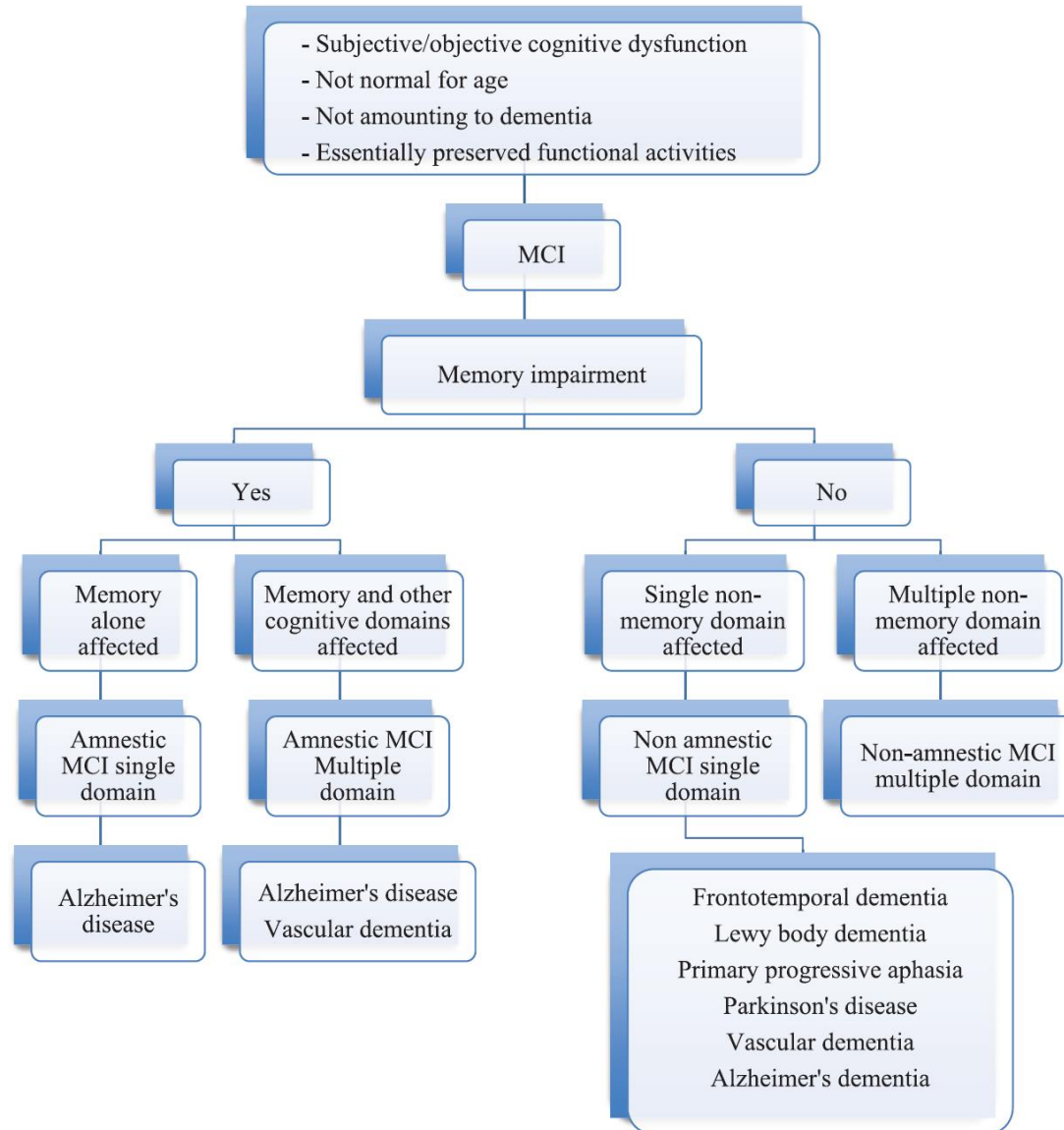
1. Original Peterson criteria (1995, 1999).
 2. Subjective complaint of memory disturbance (preferably supported by an informant)
 3. Objective evidence of memory deficit
 4. Generally preserved other cognitive functions
 5. Intact daily living skills
 6. Absence of dementia
- 

NOT ALL MCI IS THE SAME

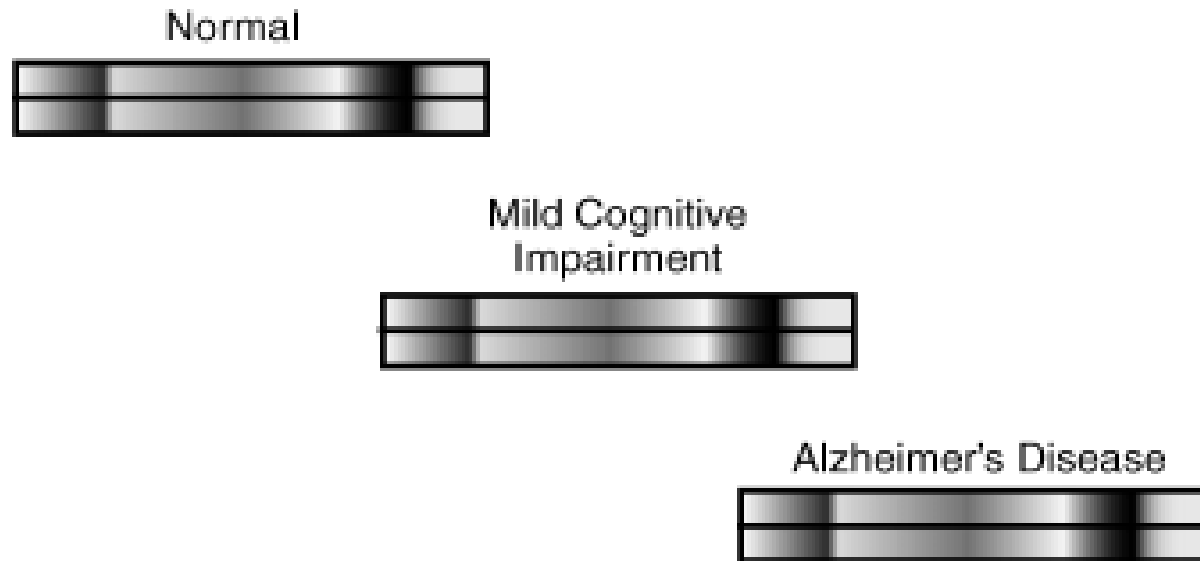
- Petersen revised his diagnostic conceptualization of MCI in 2001 and again in 2004
 - Incorporates different etiologies for MCI
 - Traumatic brain injury
 - Vascular etiologies
 - FTD, LBD, PD, etc.....
- Now includes different subtypes of MCI
 - Amnestic (deficits exclusively in episodic learning/memory)
 - Non-amnestic (deficits in a single non-memory domain)
 - Single-domain (only one cognitive domain affected)
 - Multi-domain (multiple cognitive domains affected)



PETERSEN DECISION TREE FOR DIAGNOSING MCI



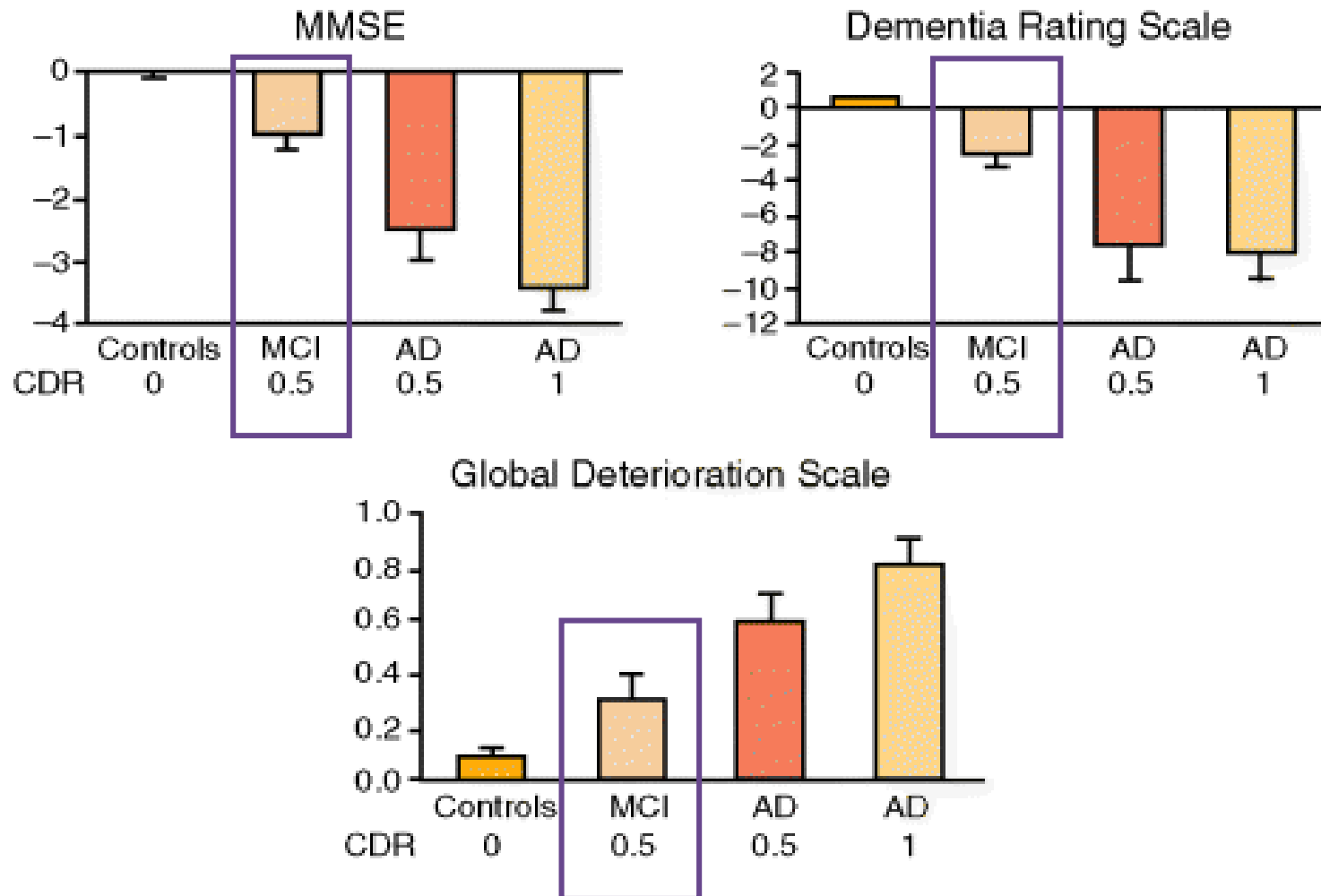
MCI IS A TRANSITIONAL PHASE



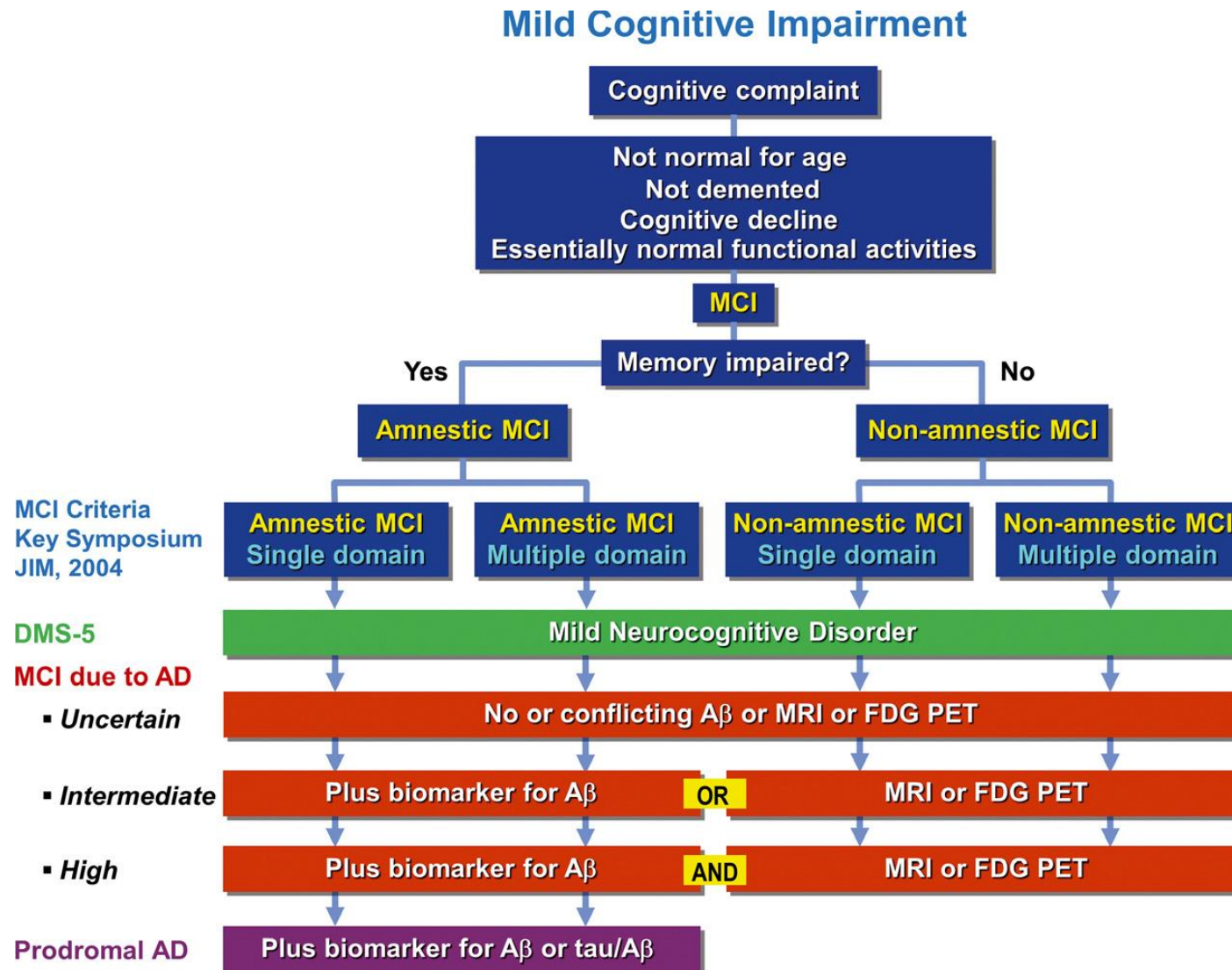
Peterson et al., 2004

- “MCI constitutes that level of cognitive function wherein low-functioning normal, older persons cannot reliably be distinguished from high-functioning persons with dementia” (Smith & Bondi, 2013)
- The vast majority (but not all) of individuals with MCI will decline to dementia eventually.
- MCI can be thought of not as a “condition” present in the patient, but as an area of diagnostic uncertainty for the clinician.
 - Is this person destined for dementia or not?

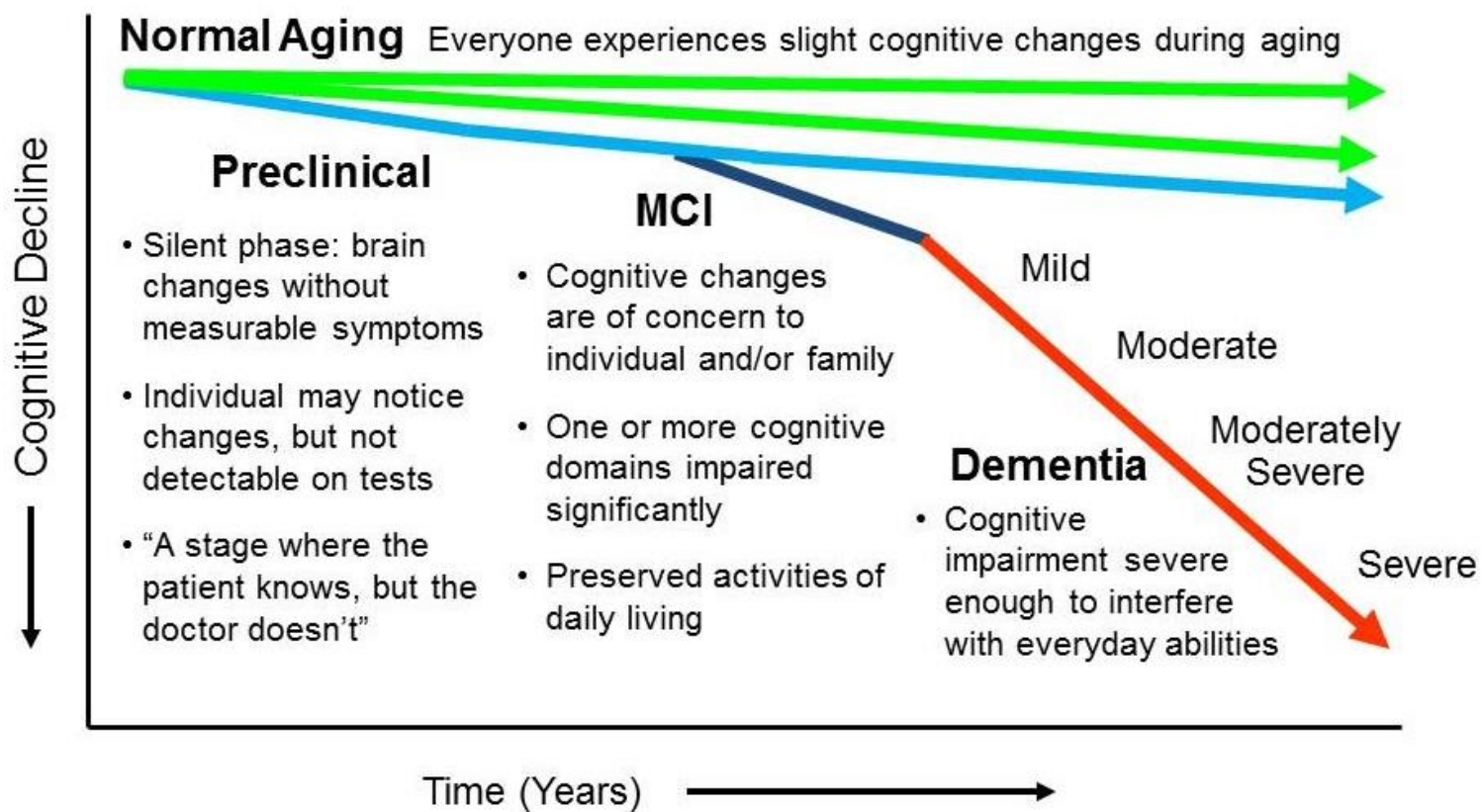
MCI IS A TRANSITIONAL PHASE



DIAGNOSTIC DECISION TREE FOR MCI DUE TO AD INCORPORATING BIOMARKERS



A Continuum Perspective of MCI as a transitional phase of AD



<http://www.mind.uci.edu/alzheimers-disease/what-is-alzheimers/mild-cognitive-impairment/>



THANK YOU FOR YOUR ATTENTION!!!!

QUESTIONS?

