Progression of Dementia

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October 15, 2019

Alzheimer Society of Manitoba

Telehealth

- No disclosures
- No relationships with financial sponsors

Increasing Prevalence

- Dementia is receiving significant political, scientific, and medical attention due to emerging high numbers of cases
- Dementia is an age-related disease
- Humans are experiencing longer life expectancies
- More and more people are living long enough to acquire dementia
- Caregiving is an essential component in management of this disease

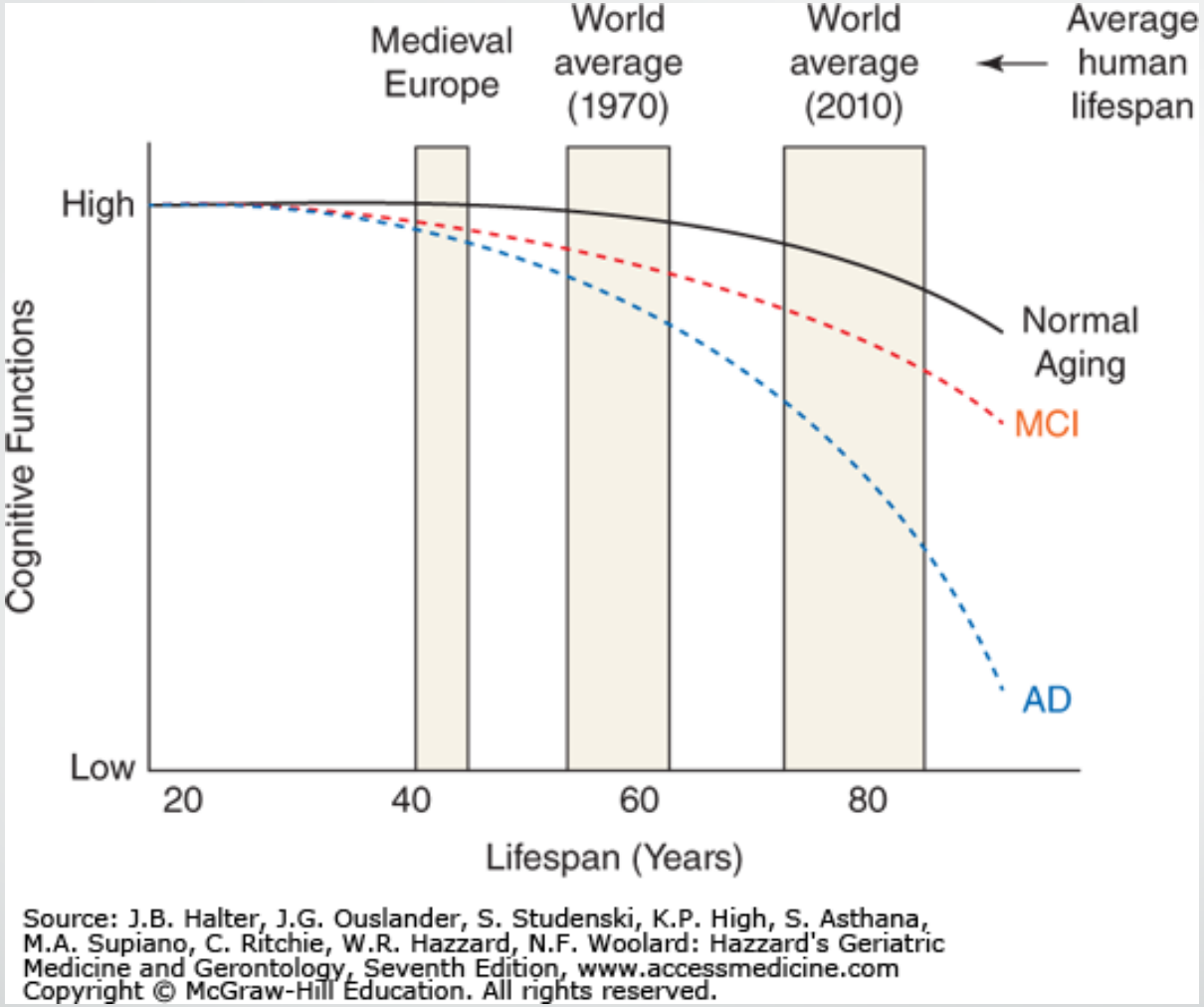
Age-Related Disease

AGE	PREVALENCE
65-74	3%
75-84	17%
85+	32%
Overall 65+	20%

Young Onset Dementia

- Under age 65, usually age 45-55
- Represents 1-5% of all dementia cases

Hazzard's Textbook of Geriatric Medicine and Gerontology, 7e, 2017



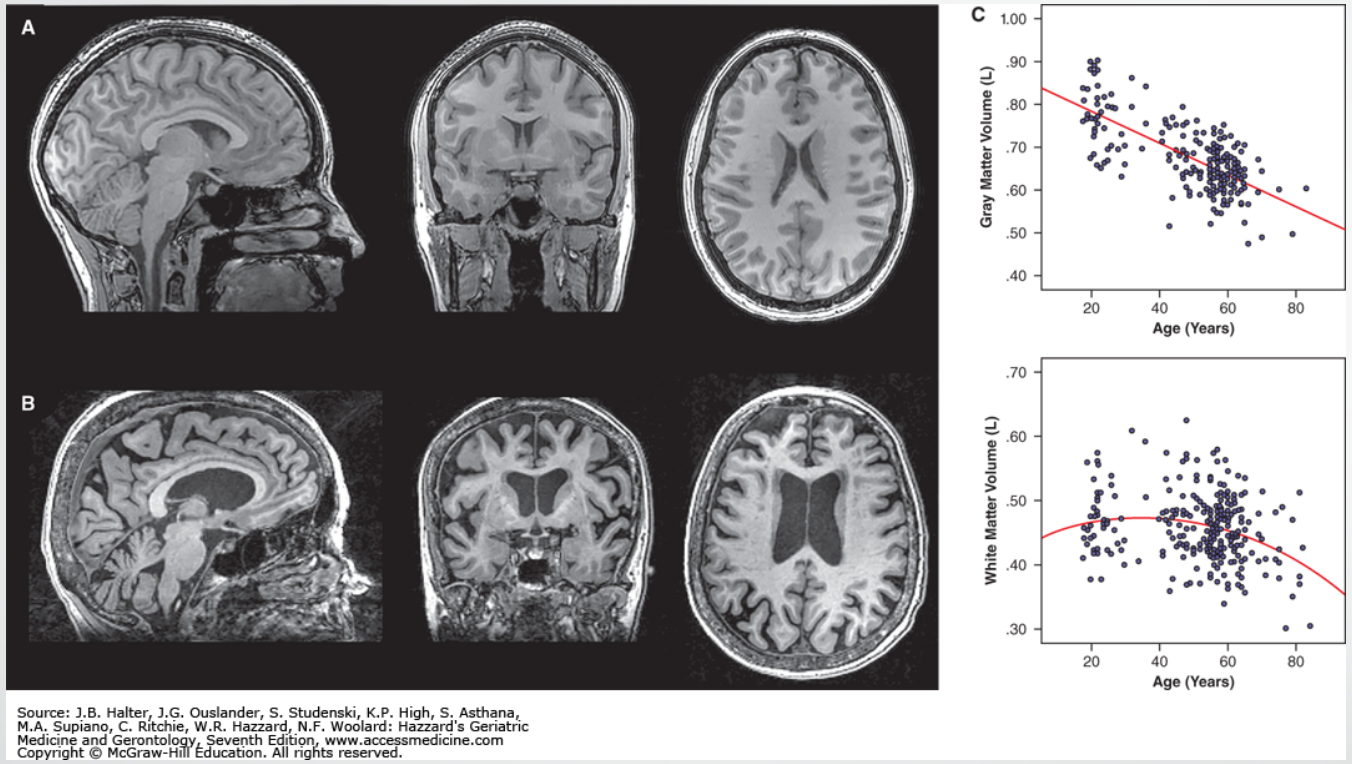
Source: J.B. Halter, J.G. Ouslander, S. Studenski, K.P. High, S. Asthana, M.A. Supiano, C. Ritchie, W.R. Hazzard, N.F. Woolard: Hazzard's Geriatric Medicine and Gerontology, Seventh Edition, www.accessmedicine.com

Cognitive changes as a result of aging. Trends of normal aging, mild cognitive impairment (MCI), and dementia due to Alzheimer disease (AD) are shown. Due to the progressive increase in lifespan, a higher number of individuals can now reach the age where specific cognitive changes (as a result of normal aging, MCI, or AD) are observed.

Citation: Cellular and Neurochemical Aspects of the Aging Brain, Halter JB, Ouslander JG, Studenski S, High KP, Asthana S, Supiano MA, Ritchie C. *Hazzard's Geriatric Medicine and Gerontology, 7e;* 2017. Available at: https://accessmedicine.mhmedical.com/content.aspx?bookid=1923&sectionid=144523231 Accessed: October 14, 2019

Normal Cognitive Changes

- Structural changes in brain matter
  - Atrophy
  - Deposition of B-amyloid plaques



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Volumetric changes in the human brain as a function of age. A. Magnetic resonance imaging (MRI) sections from a 24-year-old healthy woman; B. MRI sections from an 80-year-old healthy woman (nondemented, Mini Mental State Examination = 30, APOE ε3/ε3). The older brain has more atrophy, larger sulci, larger ventricles, and different shape of ventricles due to loss of tissue. Atrophied cerebellum is also noticeable. C. Scatter plots of total gray matter volume (upper panel) and white matter volume (lower panel) derived from healthy volunteers who underwent T_1-weighted MRI. Gray matter shows a linear decline with age, whereas white matter (largely myelin) shows a nonlinear decline. (Courtesy of Dr. Barbara Bendlin, Department of Medicine, University of Wisconsin-Madison.)

Chemical and Biological Changes in Dementia

- Inflammatory environment
- Increased Beta-amyloid plaque formation
- Atherosclerosis and arteriosclerosis
- Deposition of protein aggregates

Natural changes

+

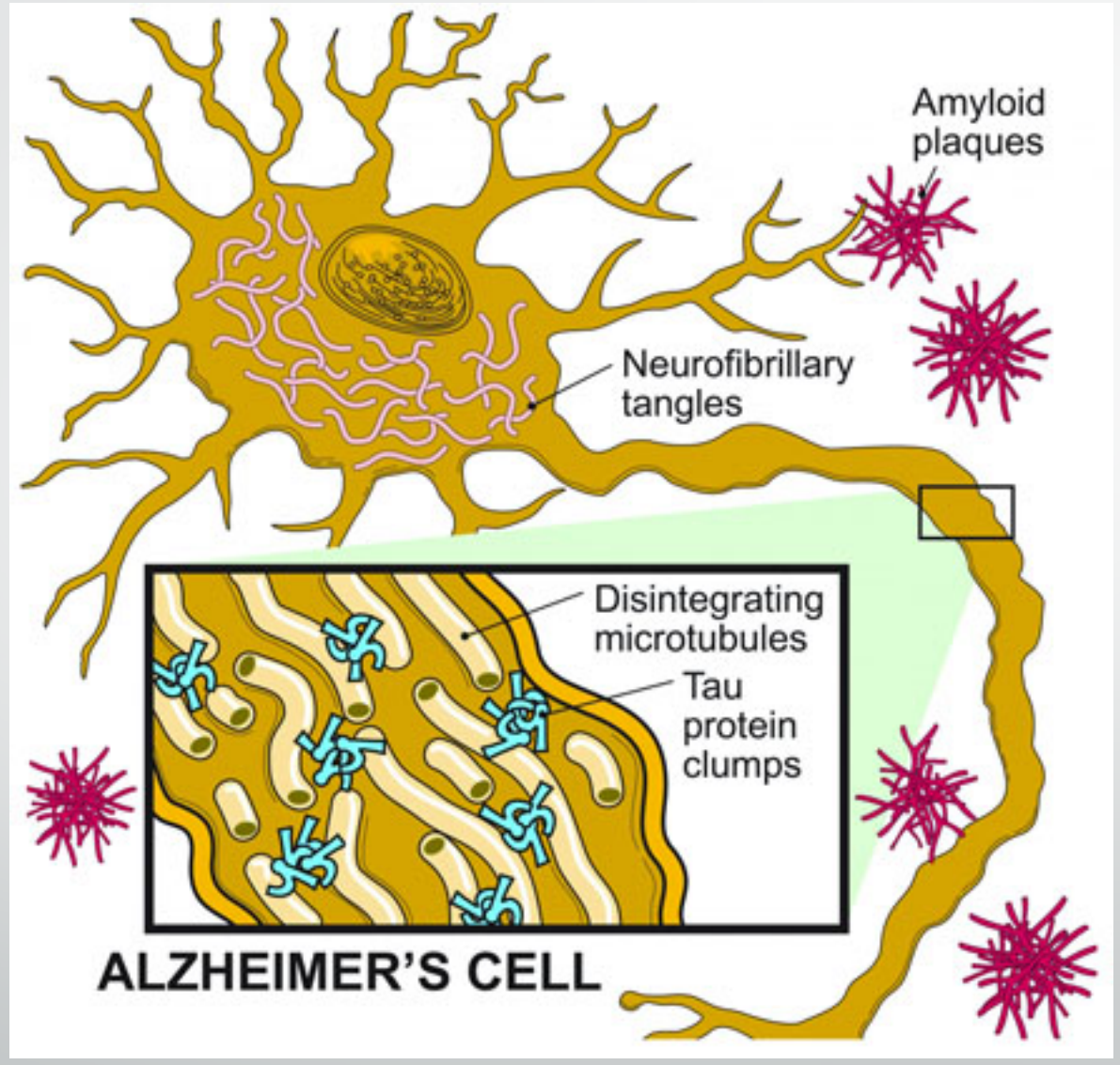
Genetic

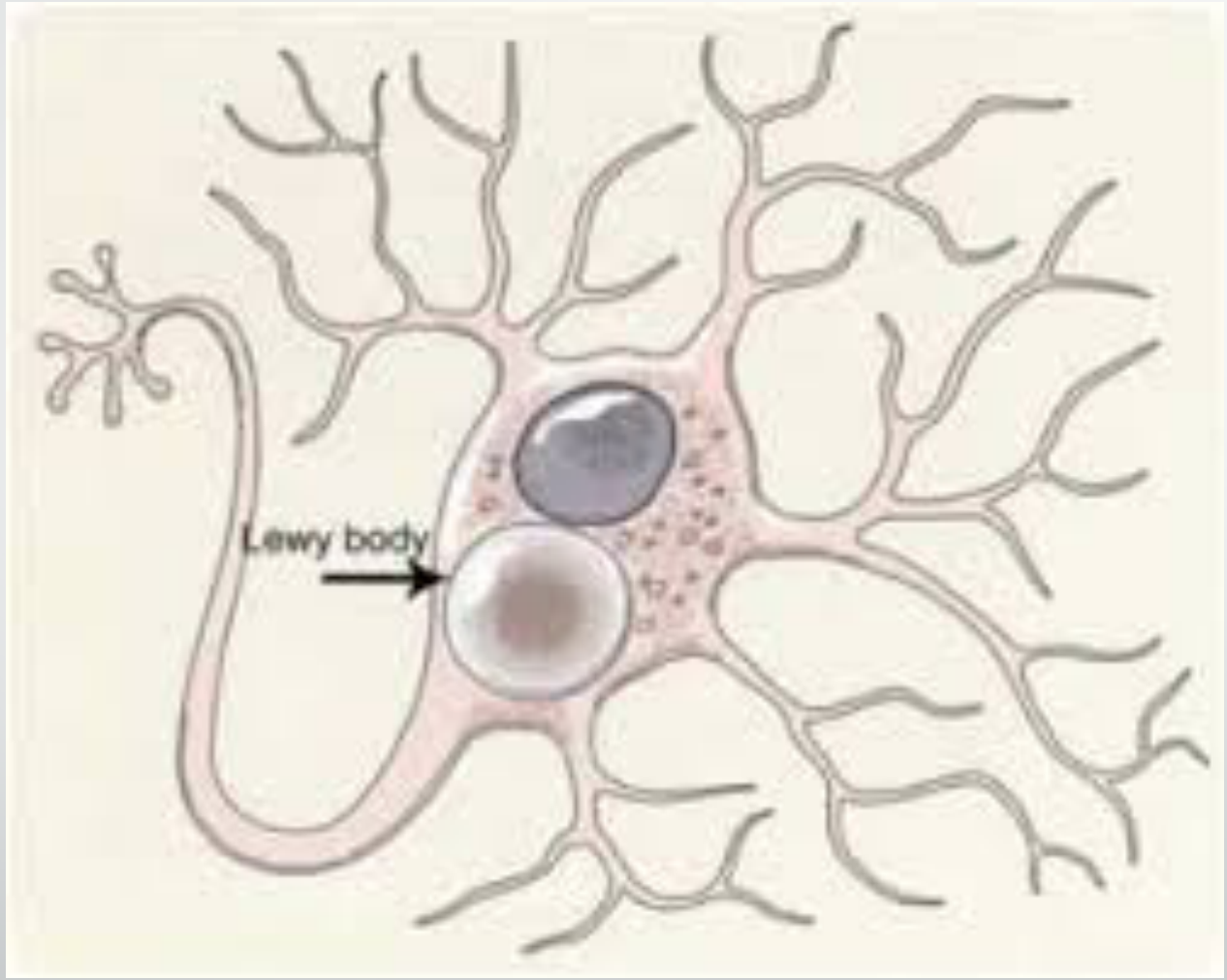
+

Environmental

Abnormal Protein Deposition in Dementia

Type of Dementia	Protein Aggregate	Atherosclerosis
All Types	Beta-Amyloid Plaques	+
Alzheimer's Dementia	Tau Neurofibrillary Tangles	+
Frontotemporal Dementia	Tau Neurofibrillary Tangles	+
Lewy Body Dementia	Lewy Bodies (alpha-synuclein)	+
Parkinson's Disease Dementia	Lewy Bodies (alpha-synuclein)	+
Vascular Dementia	-	+++

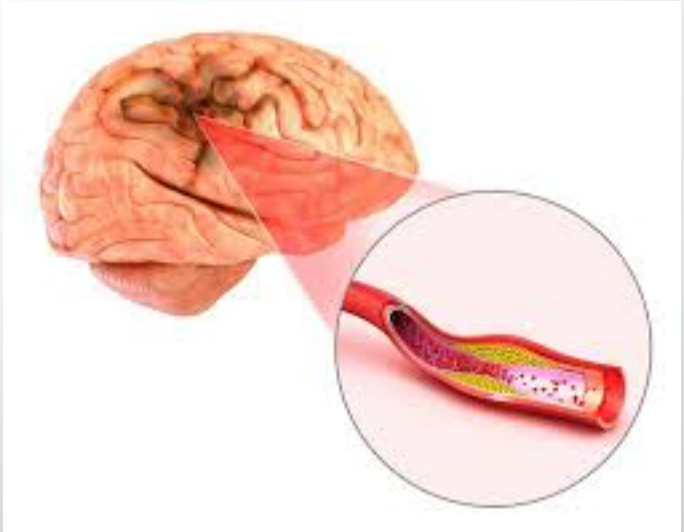

Amyloid plaques
Neurofibrillary tangles
Disintegrating microtubules
Tau protein clumps
ALZHEIMER'S CELL


Lewy body

VASCULAR CHANGES - ATHEROSCLEROSIS

BLOCKED BLOOD VESSELS

DECREASED BLOOD FLOW TO BRAIN



RISK FACTORS:

- *DIABETES*
- *HIGH BLOOD PRESSURE*
- *SEDENTARY LIFESTYLE*
- *INADEQUATE FRUITS AND VEGETABLES*

Cognitive Changes – Initial Symptoms

- Attention – almost always affected initially
  - Ability to sustain attention on a task
  - Ability to concentrate on more than one piece of information at a time
  - Ability to block out irrelevant information

Cognitive Changes – Initial Symptoms

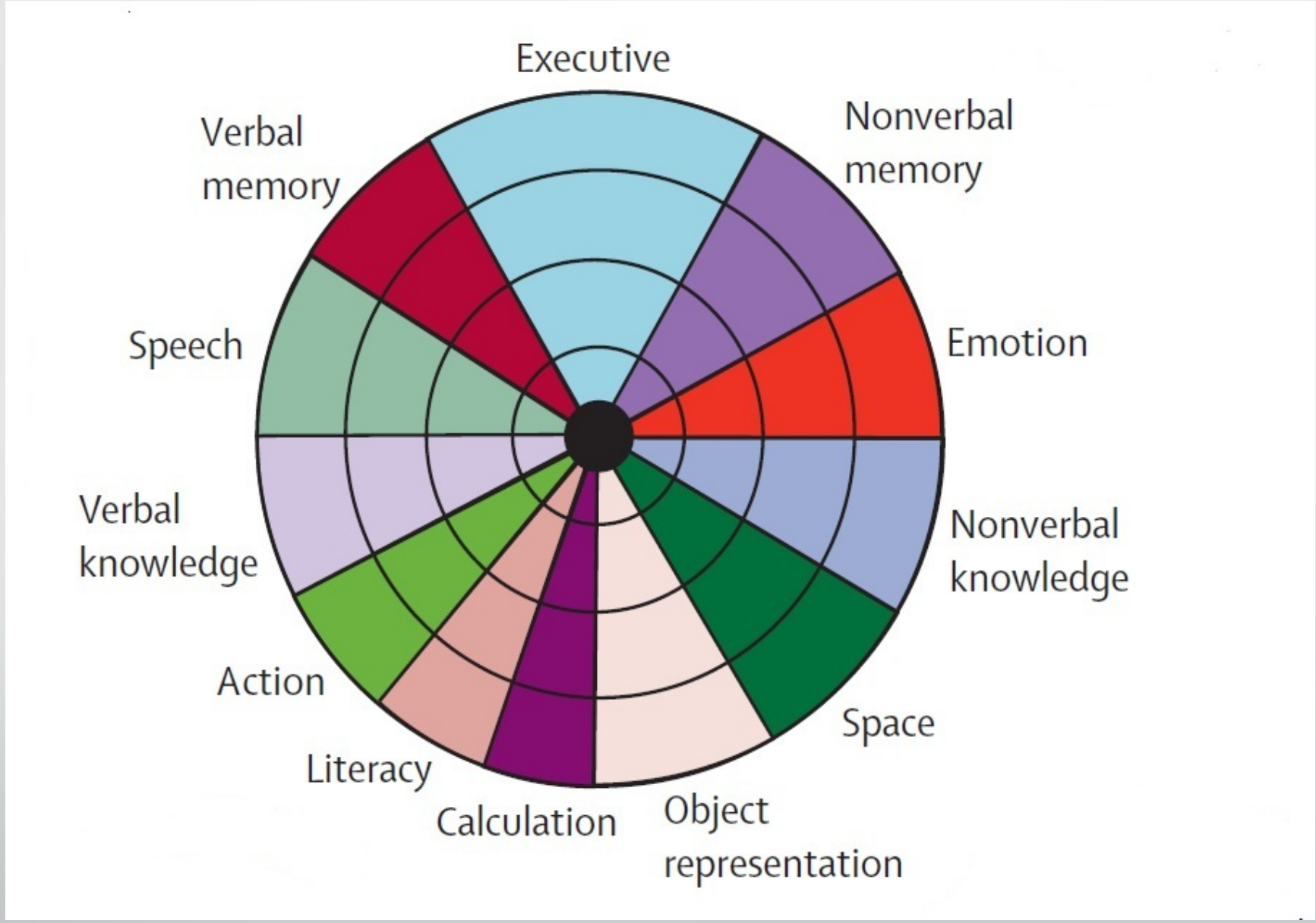
- "Amnestic" – slowly progressive memory loss for recent events that *affects daily function*
  - Forget conversations, dates, appointments (cueing doesn't help)
  - Misplace items

Cognitive Changes – Initial Symptoms

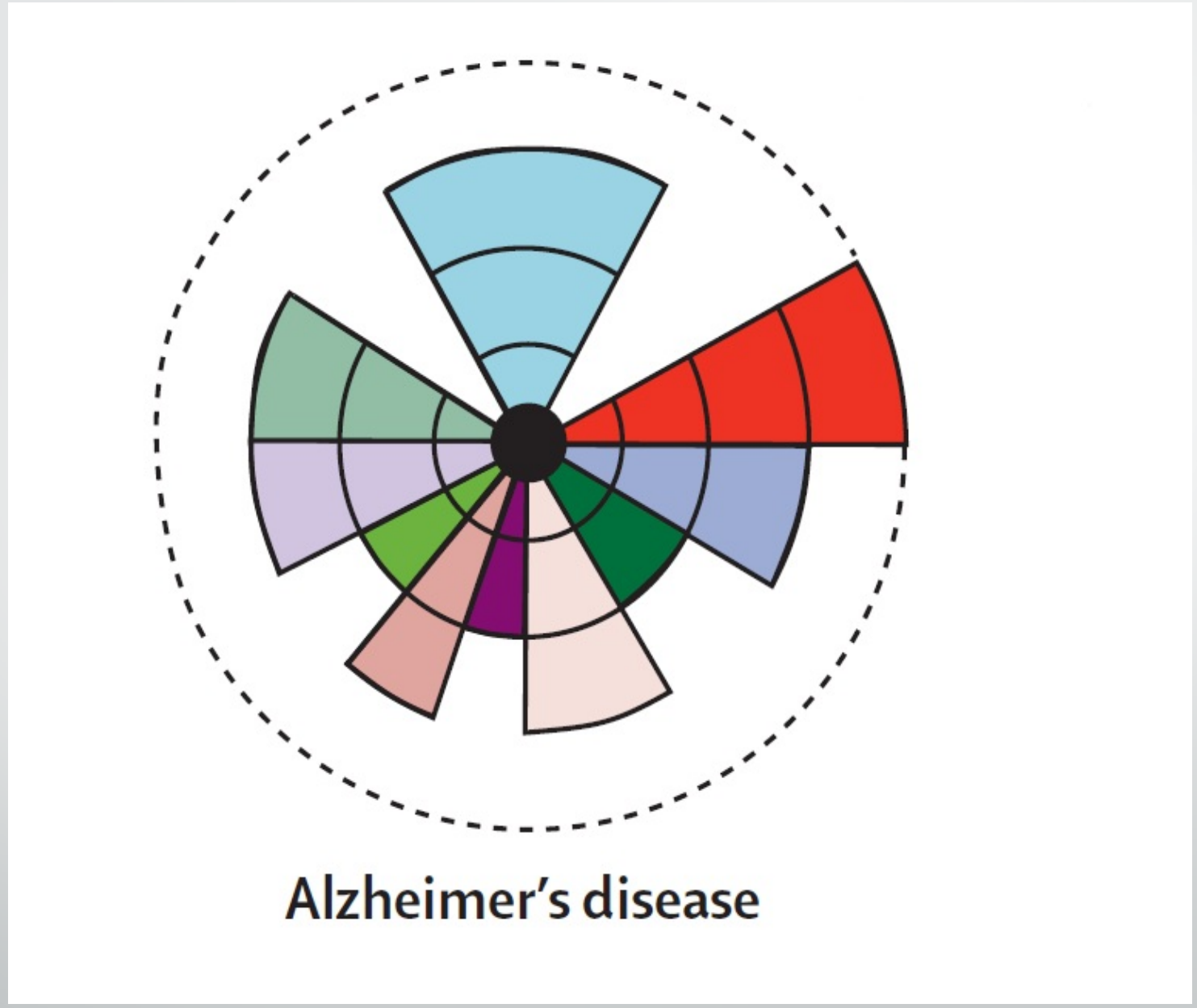
- "Non-amnestic" – impairments in other cognitive domains that *affect daily function*
  - Language
  - Visuospatial
  - Executive Function
  - Social Cognition

Progression

- Initial symptoms help to identify the type of dementia
- Once the disease is moderate to severe, most dementias are clinically indistinguishable



Rossor MN. Lancet Neurol 2010;9:793-806



Rossor MN. Lancet Neurol 2010;9:793-806

Mild Dementia

- Need help with *instrumental* Activities of Daily Living
  - Banking
  - Driving
  - Medications
  - Shopping
  - Cooking
  - Cleaning
  - Laundry

Moderate Dementia

- Need help with some *basic* Activities of Daily Living
- Need *cueing* first, then need *hands-on* assistance
  - Dressing
  - Bathing
  - Hygiene, toileting
  - Urinary incontinence, then fecal incontinence

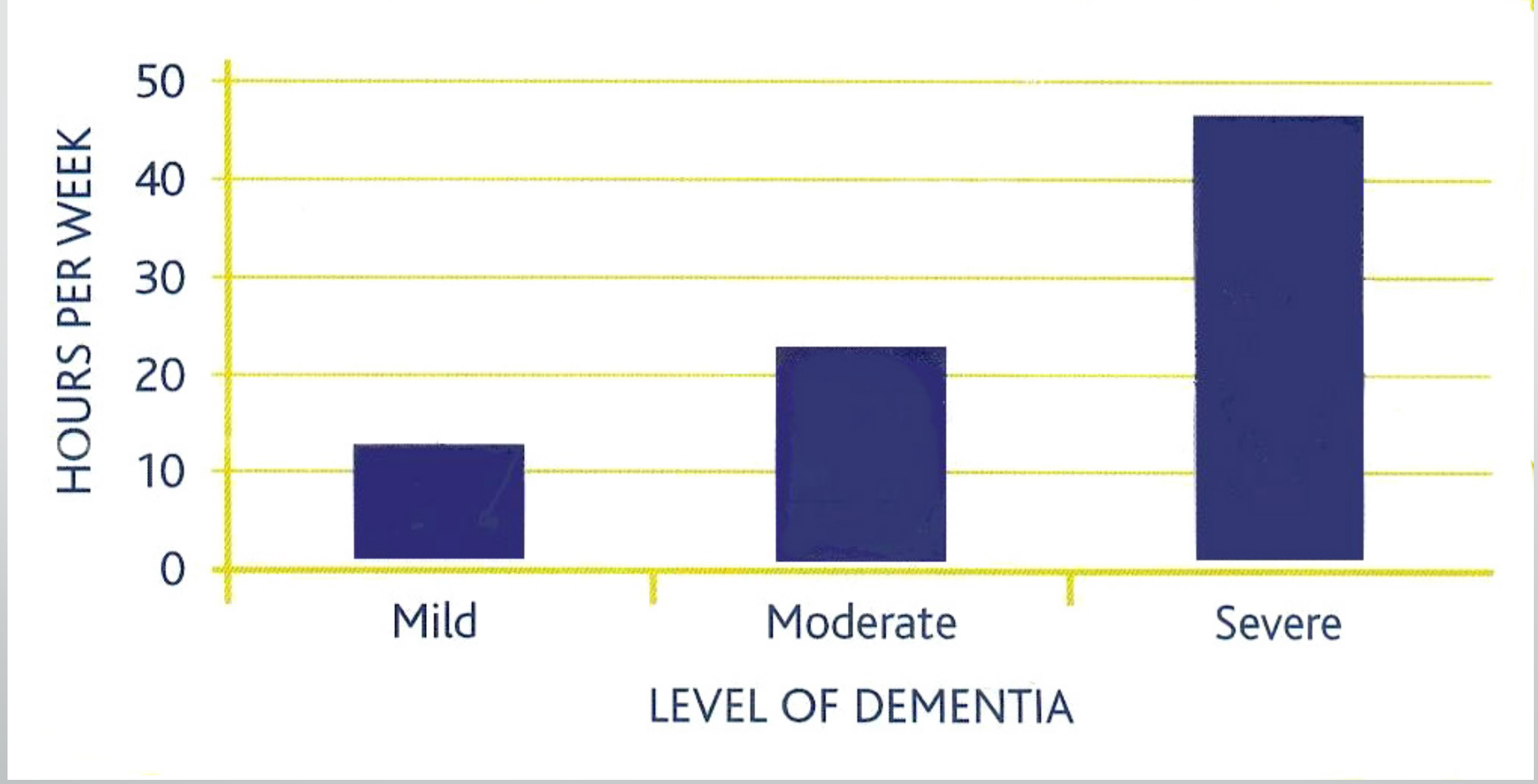
Severe Dementia

- Need help with all *basic* Activities of Daily Living
  - Difficulty swallowing
  - Speech decreases to single words
  - Need assistance with feeding

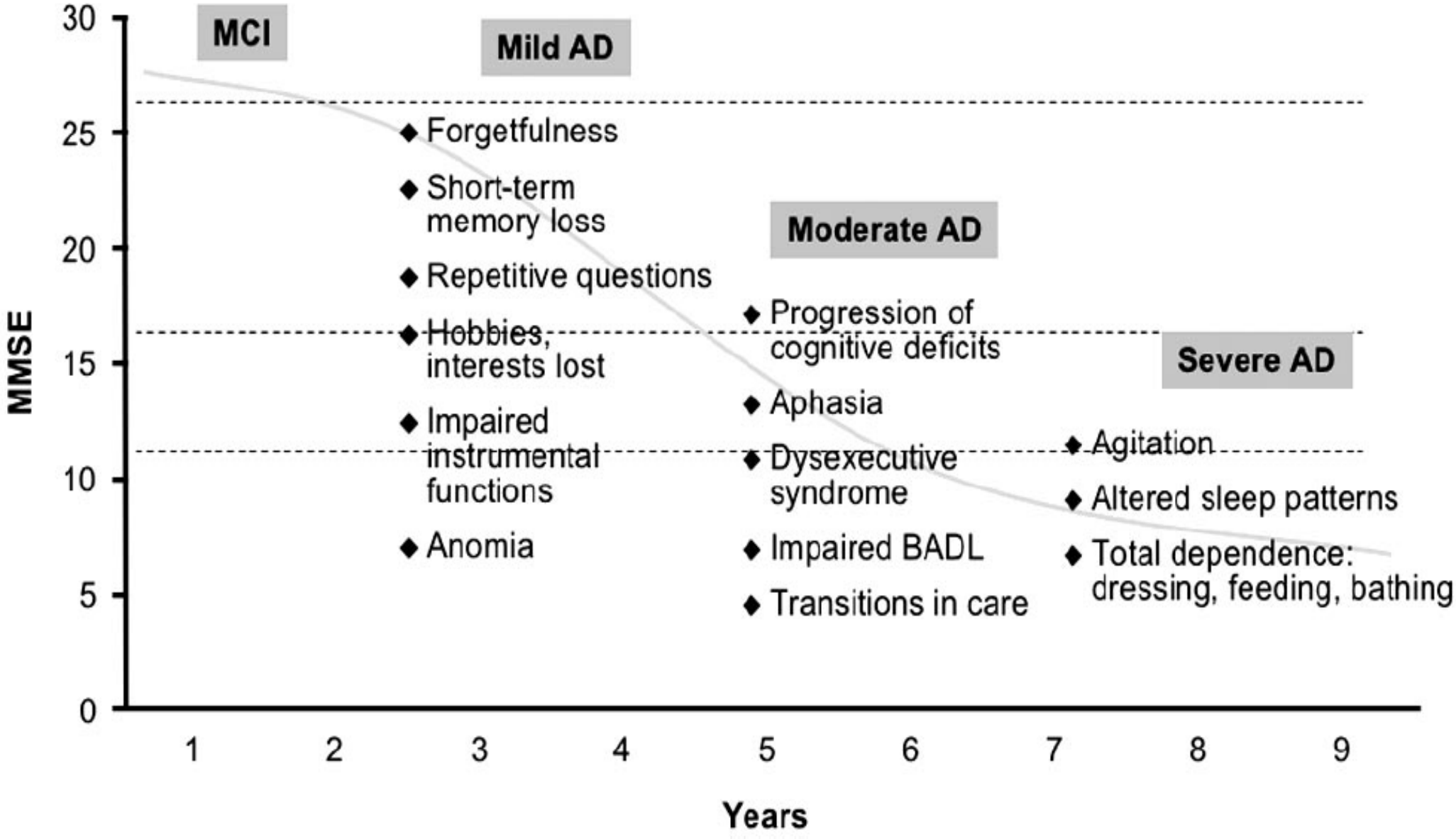
Very Severe Dementia

- Lose ability to walk
- Lose ability to sit up
- Lose ability to smile
- Lose ability to hold up head

Number of hours per week associated with the care of elderly people with increasing levels of dementia



ALZHEIMER'S DISEASE – TIME COURSE



Changes in Behavior or Personality

- Disinhibition
- Loss of Empathy

Irritability

- Common in early dementia
- Do not like to be reminded of impairments
- Do not like to be faced with challenges that are beyond capabilities

Sundowning

- Worsening of symptoms in the evening

Disordered Sleep

- Day-Night Reversal
- REM Sleep Behavior Disorder

Depression

- Occurs in an estimated 30% of people with dementia
- May precede diagnosis of dementia
- Marked by:
  - Irritability
  - Change in sleep or appetite
  - Low energy
  - Social withdrawal
  - Diminished physical function
  - Lack of expression of joy

Behavioral And Psychiatric Symptoms Of Dementia

- May represent expression of unmet need
  - Pain, loneliness, fear, discomfort, hunger, thirst, need for exercise/movement
- Occur unpredictably during course of disease; may come and go; most common in moderate and severe stages

Behavioral And Psychiatric Symptoms Of Dementia

- Passivity/apathy
- Anxiety
- Agitation and Hostility
- Aggression – verbal or physical
- Restlessness/pacing
- Compulsive, repetitive behaviors
- Delusions
- Hallucinations
- Calling out or crying

Theory of Retrogenesis

- Links level of function to childhood developmental age
- Lose abilities in the order that they were gained
- Identifying the developmental age of person with dementia may help with caregiving

Reisberg et al, 1999. International Psychogeriatrics, Vol 11, No 1, pp7-23.

Table 1

Global Deterioration Scale (GDS)

APPROXIMATE AGE	ACQUIRED-LOST ABILITIES	ALZHEIMER STATE (FAST) [See Figure 1]
12+ years	Hold a job	3 - INCIPIENT
8-12 years	Handle simple finances	4 - MILD
5-7 years	Select proper clothing	5 - MODERATE
		6 - MODERATELY SEVERE
5 years	Put on clothes unaided	a)
4 years	Shower unaided	b)
4 years	Toilet unaided	c)
3-4 1/2 years	Control bladder	d)
2-3 years	Control bowels	e)
		7 - SEVERE
15 months	Speak 5-6 words	a)
1 year	Speak 1 word	b)
1 year	Walk	c)
6-10 months	Sit up	d)
2-4 months	Smile	e)
1-3 months	Hold up head	f)

Caring

- Consider the developmental age that corresponds to dementia stage
- Choose tasks appropriate to the developmental age
- Avoid requests that are not matched to the developmental age

Care Axioms

- Attempt to avoid trauma & humiliation
  - Most prominent humiliation is to appear "stupid"
  - Wish to avoid being questioned or challenged
  - Delusions may reflect preference to accuse others rather than admit fault

Reisberg B. Am J Alz Disease & Other Dementia 2002;17: (4)

Care Axioms

- Allow safe physical movement
  - Fundamental feature of animal kingdom
  - Under recognised need

Reisberg B. Am J Alz Disease & Other Dementia 2002;17: (4)

Developmental Age Based Care

- Not recognising stage-specific needs creates unhappiness, frustration and agitation

Reisberg B. Am J Alz Disease & Other Dementia 2002;17: (4)

Summary

- Changes in function follow a somewhat predictable course
- Changes in personality and behavior are much more unpredictable
- Progression of dementia can be viewed as the loss of abilities in the reverse order that they were learned, according to the theory of retrogenesis
- Caring for people with dementia according to their developmental age may be rewarding and successful

Thank you!