

Healthy Brain Aging & Dementia



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Alzheimer's Disease is a Public Health Crisis!

- Estimated 6.9 million Americans living with AD
- AD is 6th leading cause of death across all ages
- 1 in 3 seniors dies with some type of dementia



7 million

A circular purple graphic containing a white number '7' above the word 'million' in white lowercase letters. The background of the circle is filled with a pattern of smaller, lighter purple human silhouettes.



6th

A large purple number '6' followed by a smaller purple 'th' to indicate the 6th leading cause of death.



HEALTHY BRAIN AGING



Healthy Brain Aging

- To continue to have the ability to:
 - Think, reason and remember
 - Plan and carry out tasks
 - Live a purposeful life
 - Function normally and remain independent
 - Maintain social connectedness
 - Maintain a sense of identity

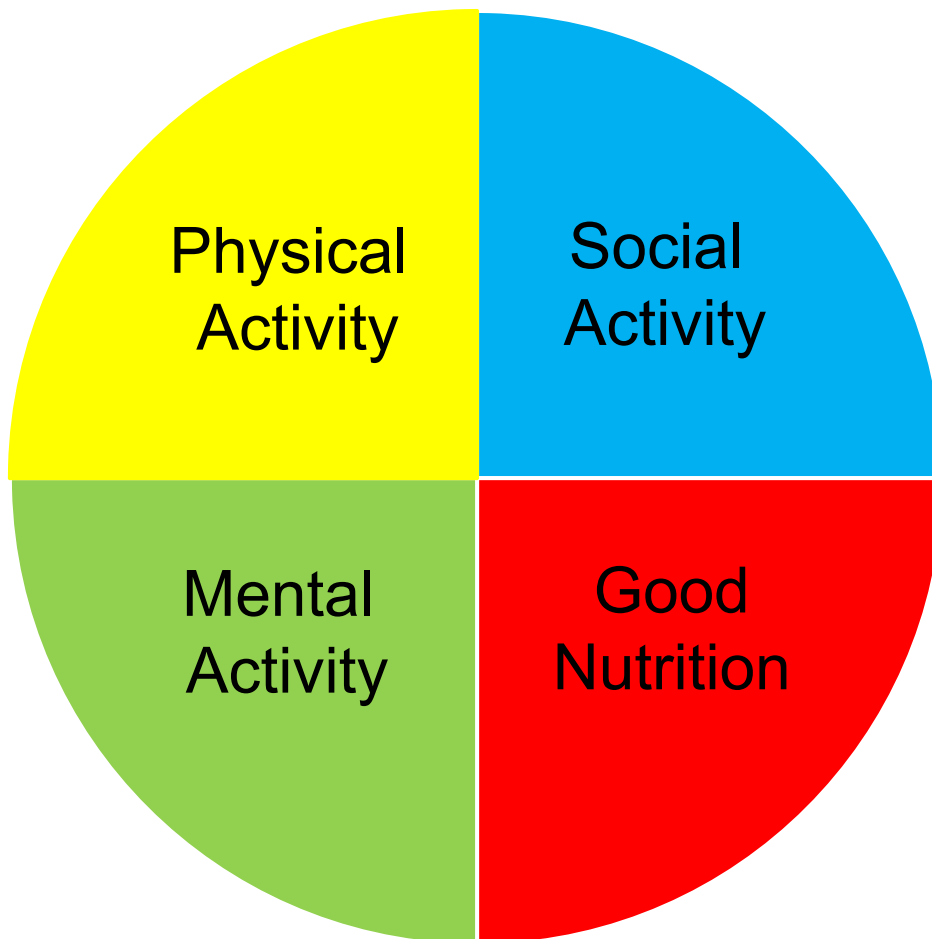
Healthy Brain Initiative: CDC and Alzheimer's Association

Brain Health As You Age: NIH, CDC, Admin. for Community Living

Changes in the Aging Brain

- Certain parts of the brain shrink, especially the hippocampus (memory center)
- Slight decline in ability to learn new things and retrieve information (remembering names, finding words)
- Difficulty in multi-tasking
- Improve in other cognitive areas, such as vocabulary, problem-solving, impulse control and judgement – “wisdom”

Maintaining Brain Health



Reducing risk factors
for heart disease



Reduce Heart Disease Risk Factors

- Control high blood pressure
- Control diabetes
- Control high cholesterol
- Avoid obesity
- Stop smoking!
- Stay physically active
- Start in mid-life, don't wait until old age!

WHAT IS DEMENTIA?



Dementia – Common Myths

- Memory loss is the same as “senility” - an inevitable part of getting old
- Nothing can be done for dementia
- Most people don’t want to know if they have dementia
- These misconceptions contribute to under-recognition of dementia

Dementia – Facts

- Dementia is NOT normal aging, it represents several types of diseases
- Dementia is common, under-diagnosed, very expensive, and fatal
- Patients with dementia should have a thorough evaluation by a physician who is experienced with dementia

Dementia Definition

- Acquired deficits (not mental retardation)
- Deficit in memory
- Deficit in at least one other cognitive domain
- Affects social and occupational function
- Absence of delirium and major psychiatric disorders

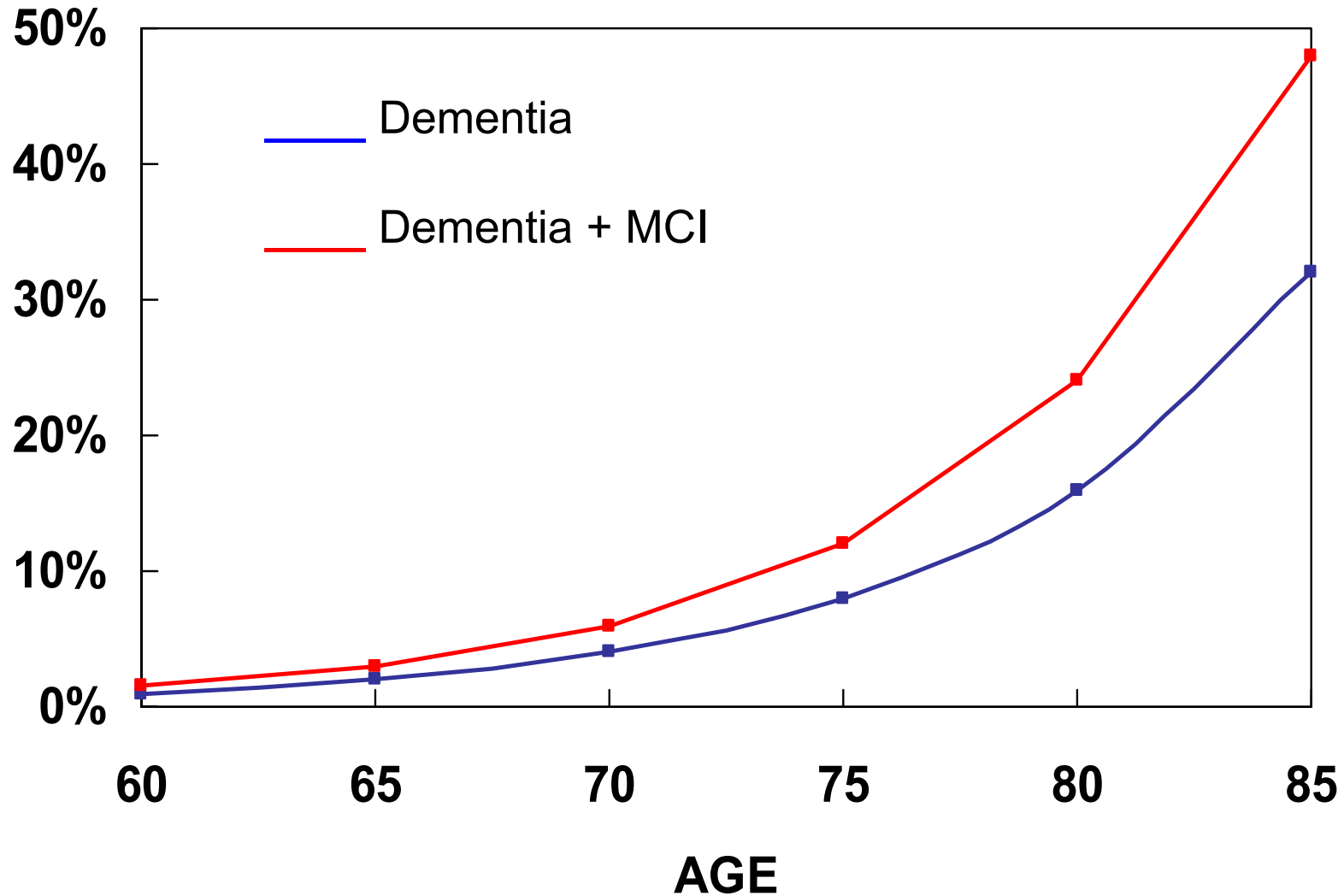
Mild Cognitive Impairment (MCI)

- Subjective cognitive complaint (pt or proxy)
- Cognitive deficit on testing in at least 1 domain (memory, language, attention, executive function, visuospatial)
- Normal social & occupational function (ie. NO DEMENTIA)
- High risk of converting to AD

How Common is Dementia?

- 13% in age 65 + years, almost 50% in 85+
- Geometric increase in prevalence of disease (after age 60, doubles every 5 years)
- Long duration of disease
- Major cause of disability, primary reason for institutionalization
- Over \$360 billion annually for care and equal cost for lost productivity
- Families bear the majority of cost

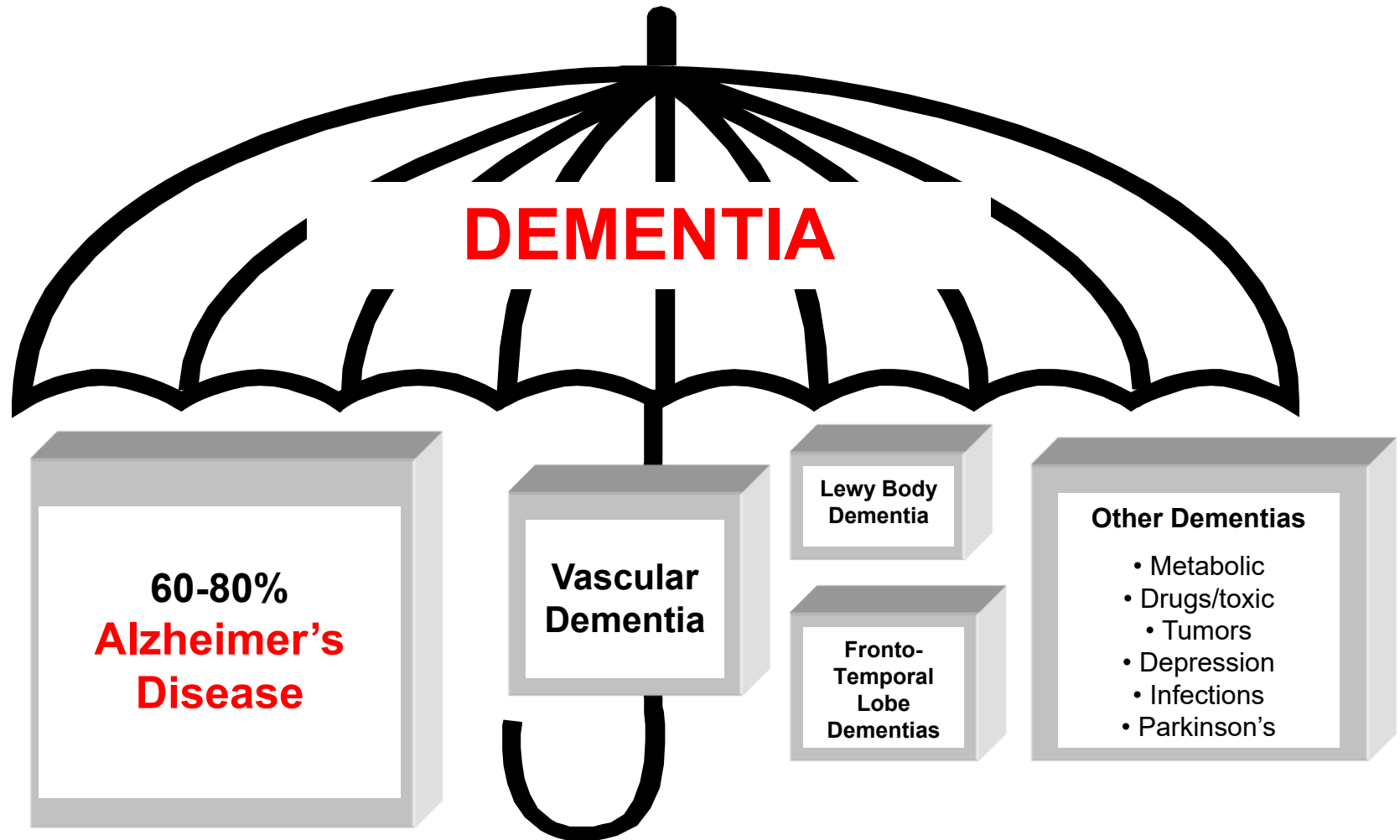
Prevalence Rates of Dementia



SUB-TYPES OF DEMENTIA



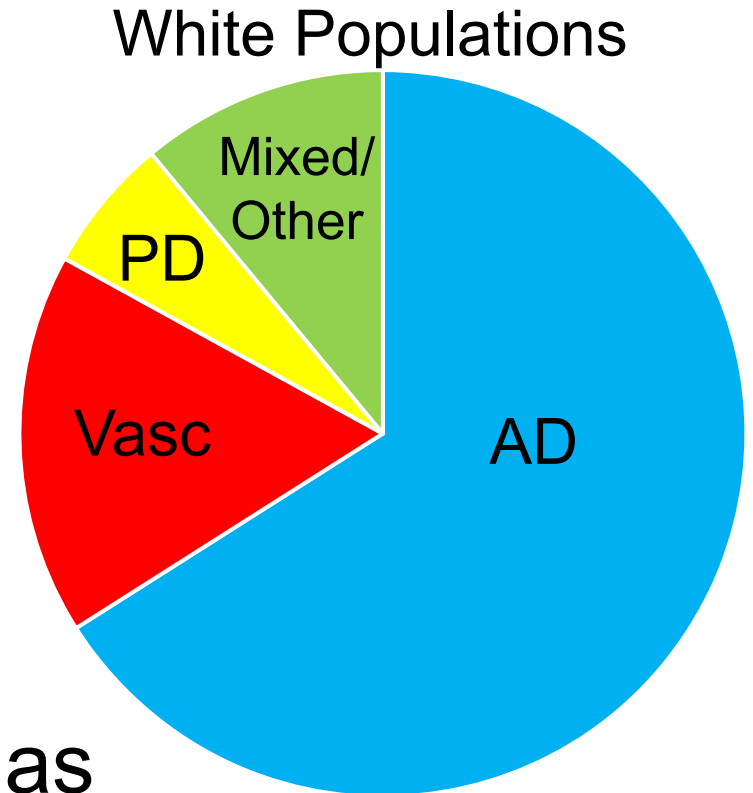
Not All Dementias Are Alzheimer's Disease (AD)



Some forms are reversible (treatable)

Dementia Sub-Types

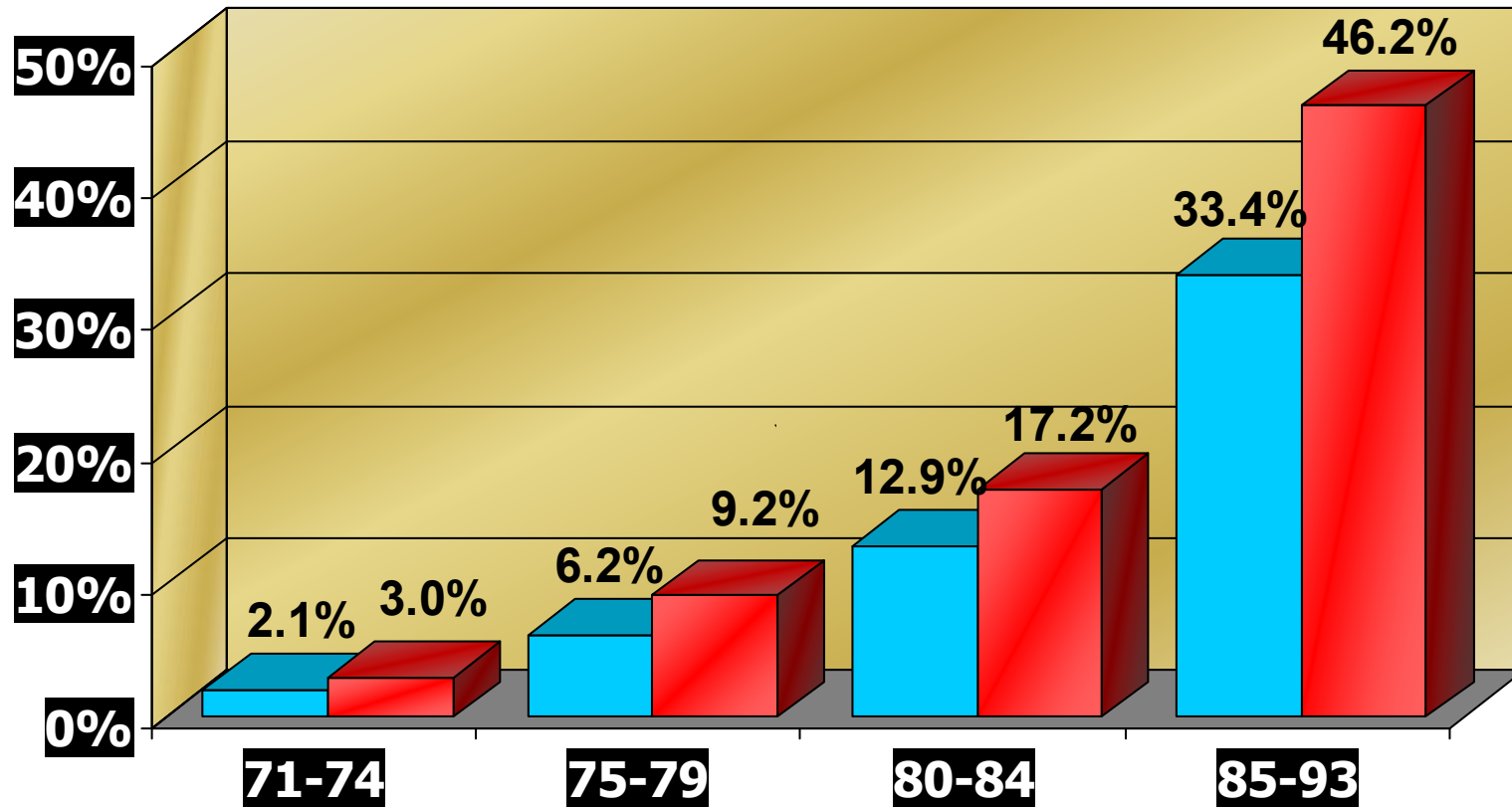
- Alzheimer's Disease
- Vascular Dementia
- Lewy Body Dementia
- Parkinson's Disease
- Fronto-Temporal Dementias
- Other causes (some possibly reversible)



Kuakini Honolulu Heart Program & Honolulu-Asia Aging Study

- HHP started in 1965 at Kuakini Medical Center
- 8,006 middle-aged Japanese-American men – study of heart disease and stroke
- HAAS began in 1991 in the HHP cohort in 3,734 men ages 71-93 years
- Purpose: to study cognitive function, dementia, disability and diseases of aging

Prevalence Rates of Dementia

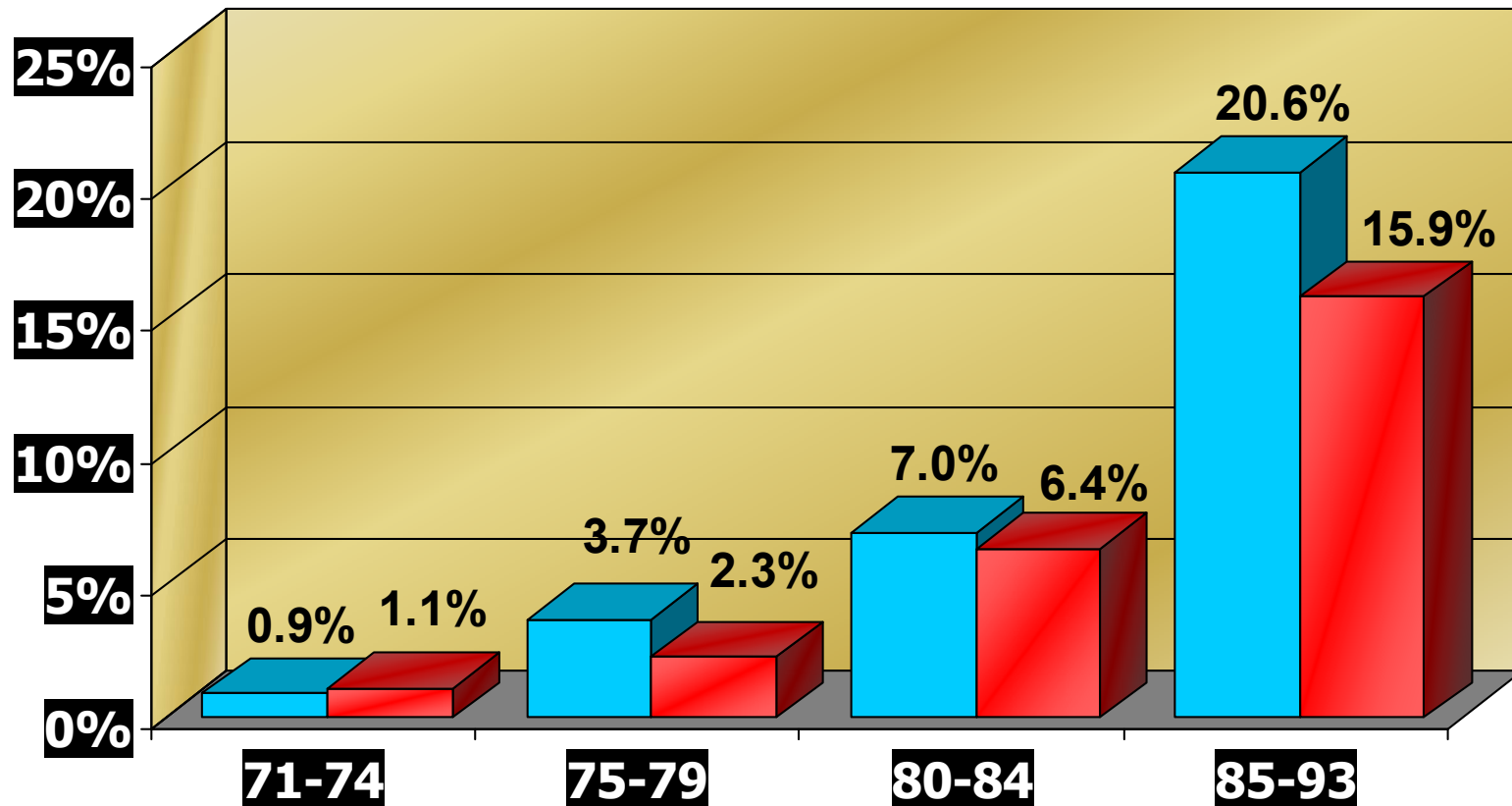


AGE GROUPS

Dementia - Overall prevalence 9.3%

Dementia + MCI - Overall prevalence 13.0%

Prevalence of Dementia Sub-Types



AGE GROUPS

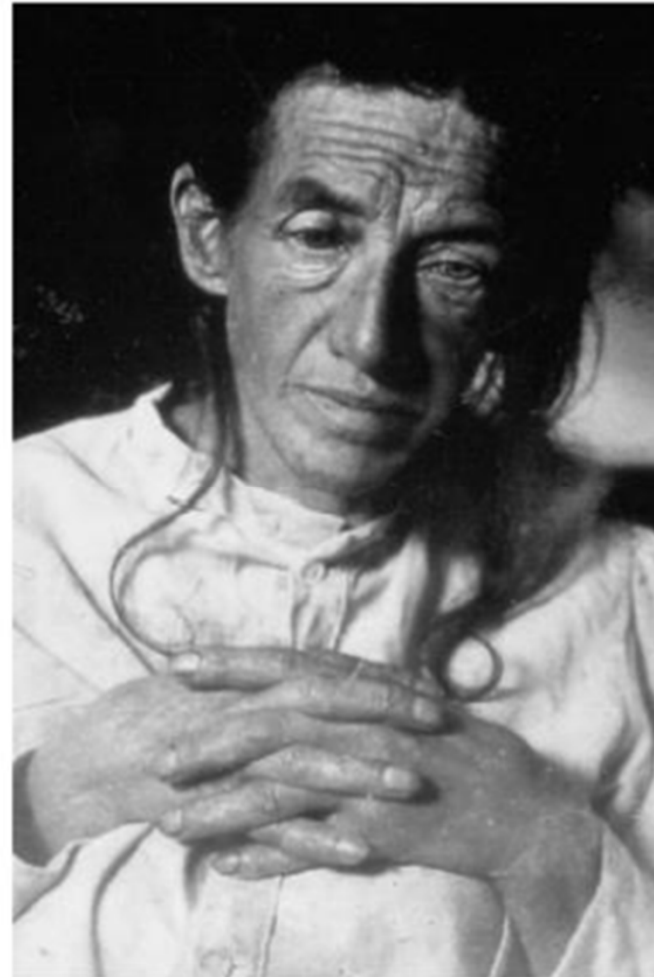
AD Component - Overall prevalence 4.2%

CVD Component - Overall prevalence 3.3%

Alzheimer's Disease

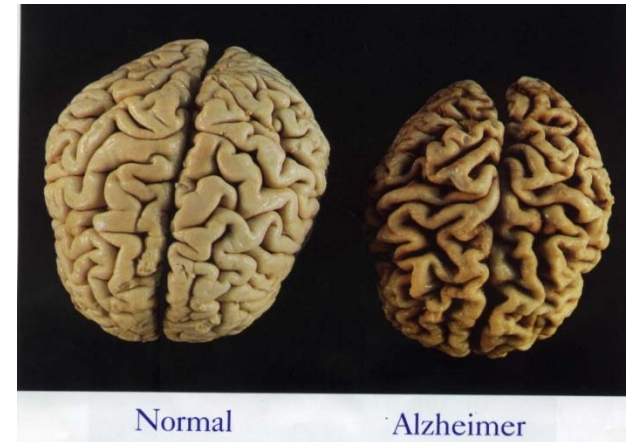
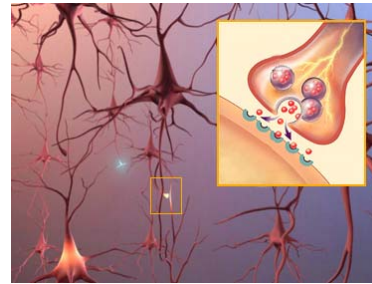
- First described by Dr. Alzheimer in 1906 – “pre-senile dementia”
- Most common cause of dementia (2/3^{rds} in Western countries)
- Short-term memory, orientation and problem-solving are affected early
- Behavior problems common
- Insidious onset, progressive course, usually slow
- Duration 2-25+ years, average 8-10 years

Alois Alzheimer and Auguste Dieter (first seen in 1901 in Frankfurt)

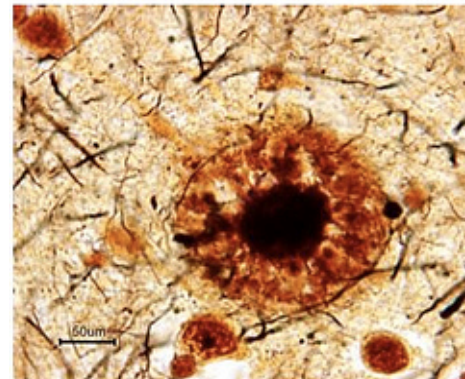


Alzheimer Pathology

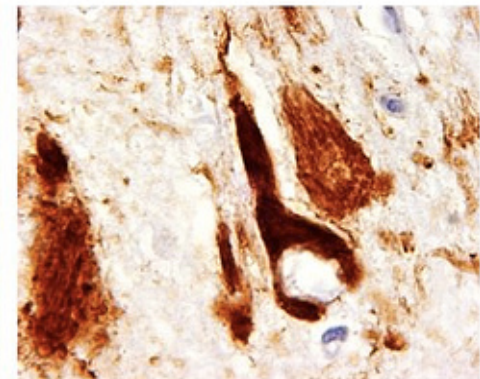
- Neurochemical abnormalities: Deficiency of acetylcholine and other neurotransmitters
- Pathology: β -amyloid plaques and neurofibrillary tangles
- NEURON LOSS!



Plaques



Neurofibrillary Tangles



RISK FACTORS



Risk Factors for AD

Non-modifiable

- Age
- Low education
- Traumatic brain injury
- Genetics

Modifiable

- Cardiovascular risk factors
 - High blood pressure
 - Diabetes
- Dietary factors
- Heavy alcohol intake
- Depression
- Chronic Inflammation
- Sleep apnea
- Hearing Impairment

Genetic Testing for AD

Late-onset (sporadic) AD

- Family Hx slight risk factor
- Apolipoprotein E4
- Increases the likelihood of developing AD, but does not guarantee it
- ApoE2 allele protective
- Testing not recommended routinely

Early-onset AD

- Familial AD – very rare (<5%)
- Autosomal dominant genes
- 3 genes identified
- Role of Down's syndrome

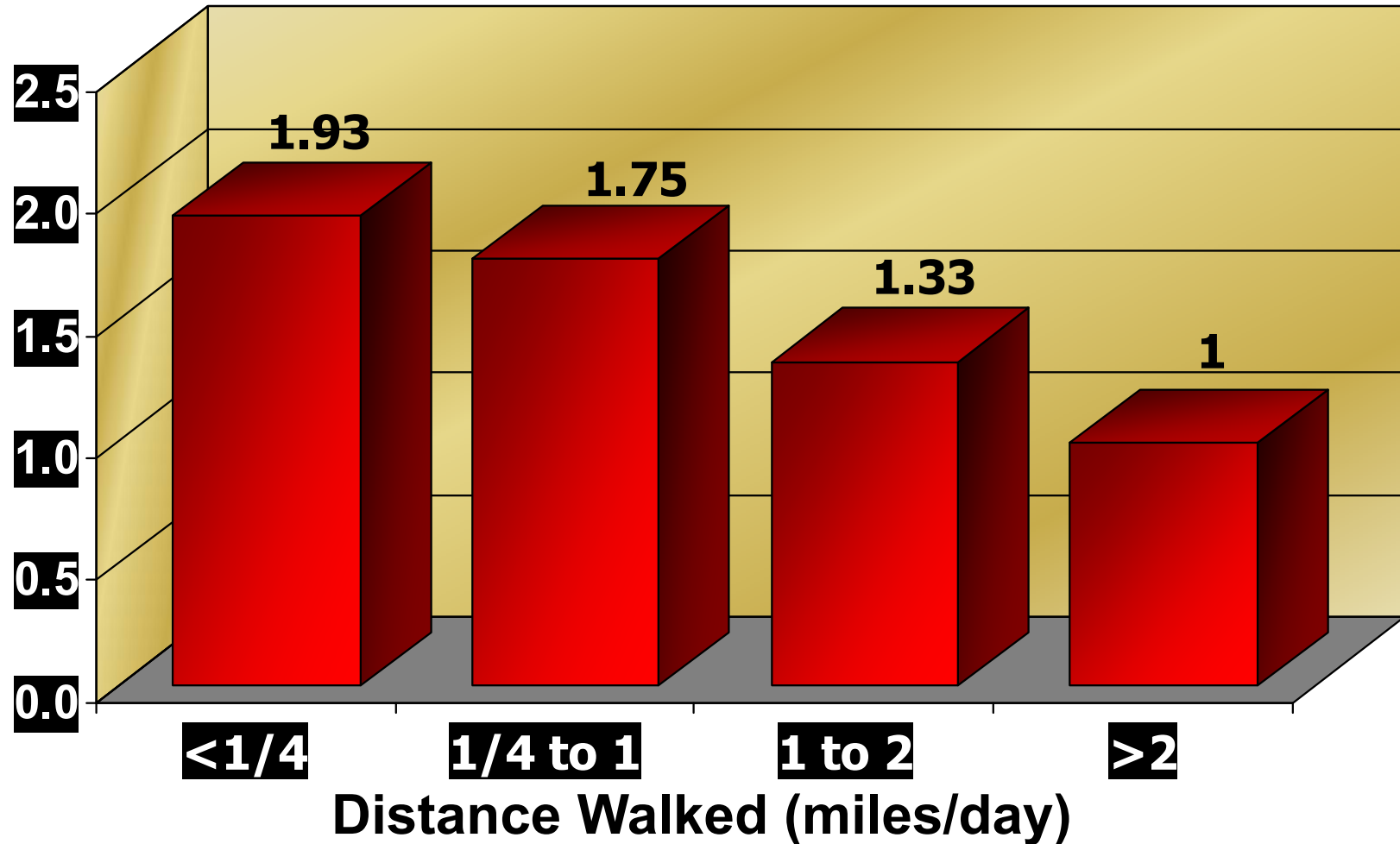
AD Potential Protective Factors

- Physical activity?
- Social activity?
- Mental activity?



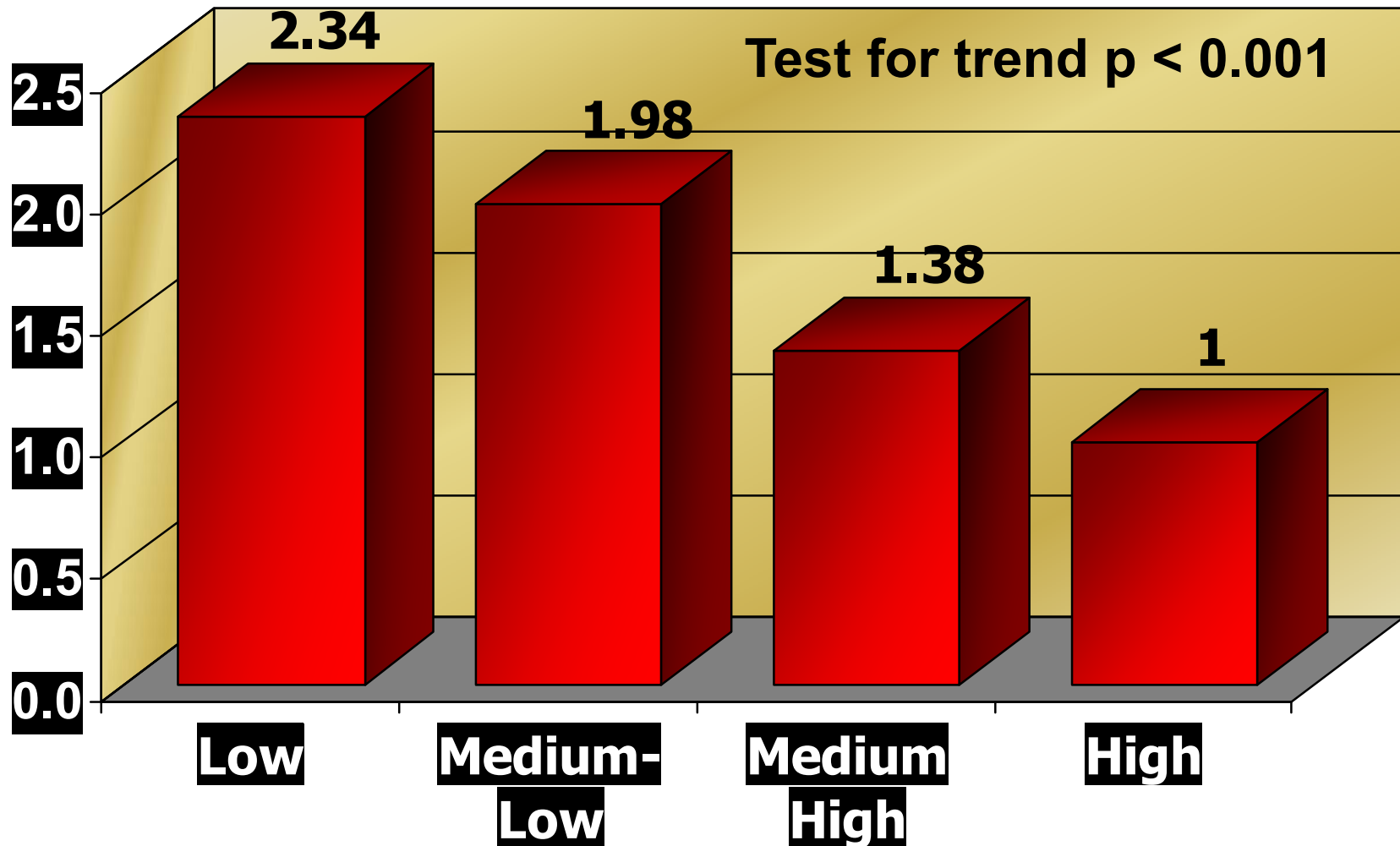
Walking and 8-Year Incident Dementia

Relative Risk



Social Engagement and Incident Dementia

Relative Risk



EARLY DETECTION IS
IMPORTANT

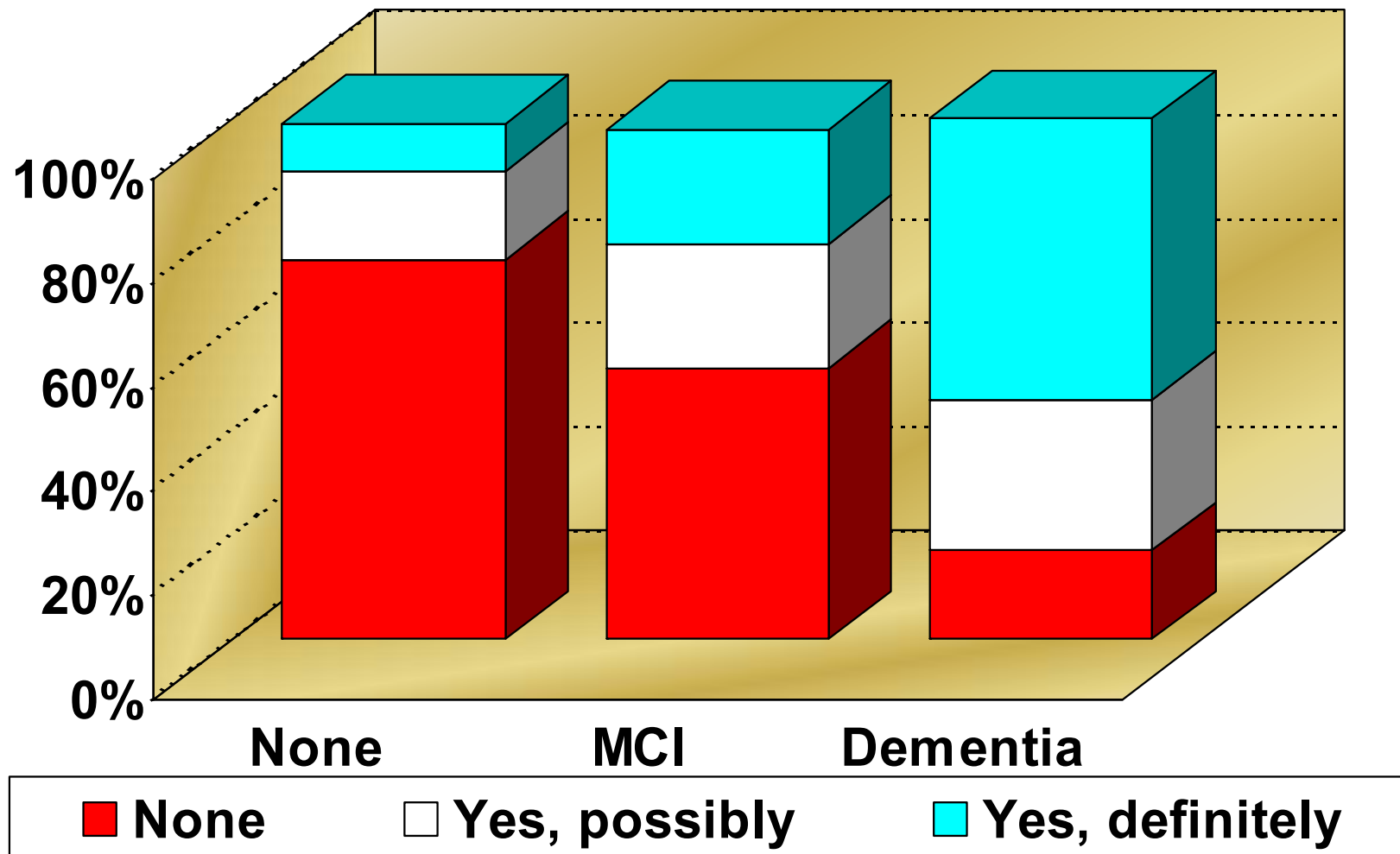


Rationale for Early Detection

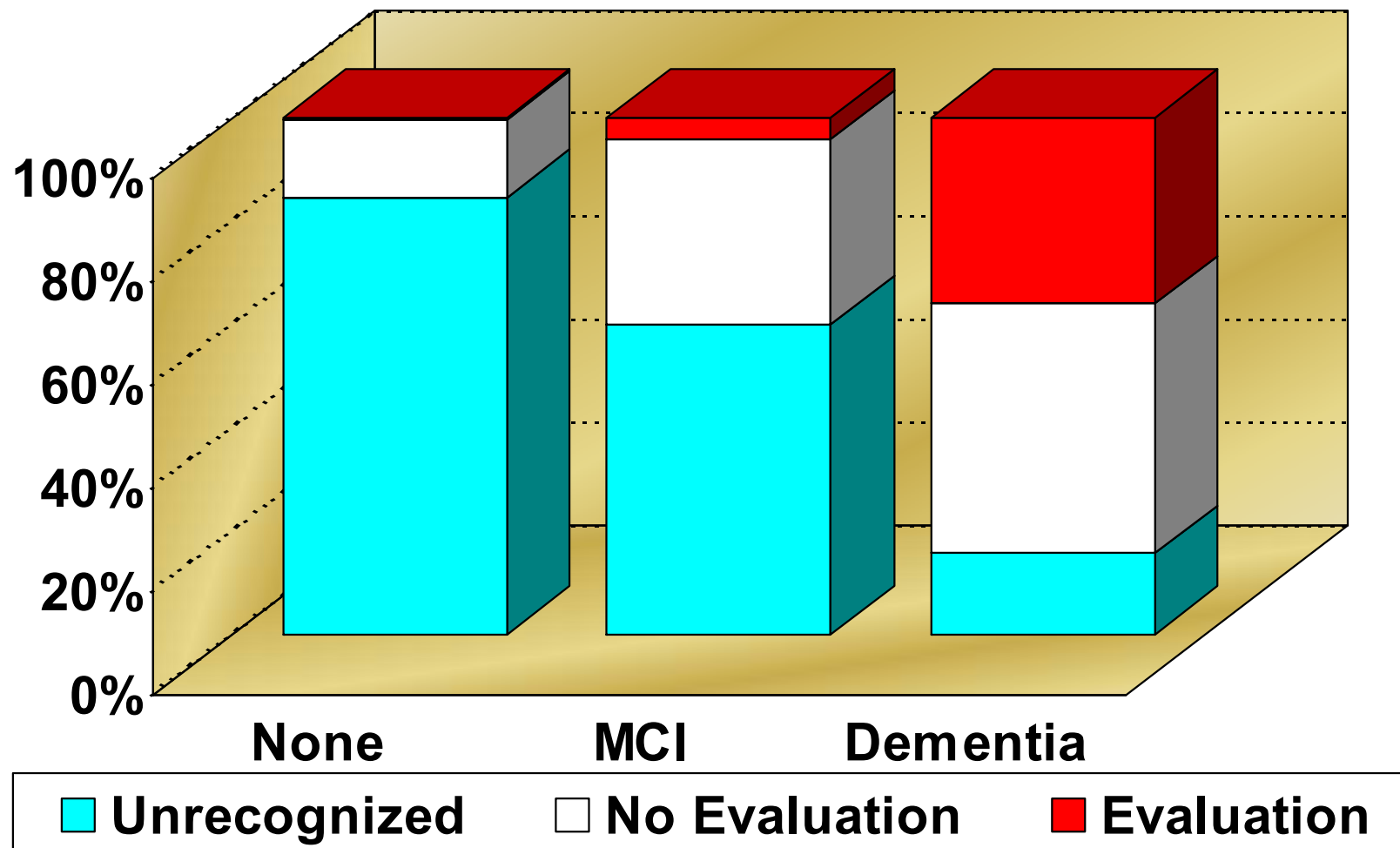
- Treatment of reversible causes
- Improve treatment of underlying conditions
- Reduce ineffective and expensive crisis-driven care
- Patient and family education
 - Advance directives and planning for healthcare
 - Financial planning
- Safety issues
- Connect to available community services

Kuakini Honolulu-Asia Aging Study

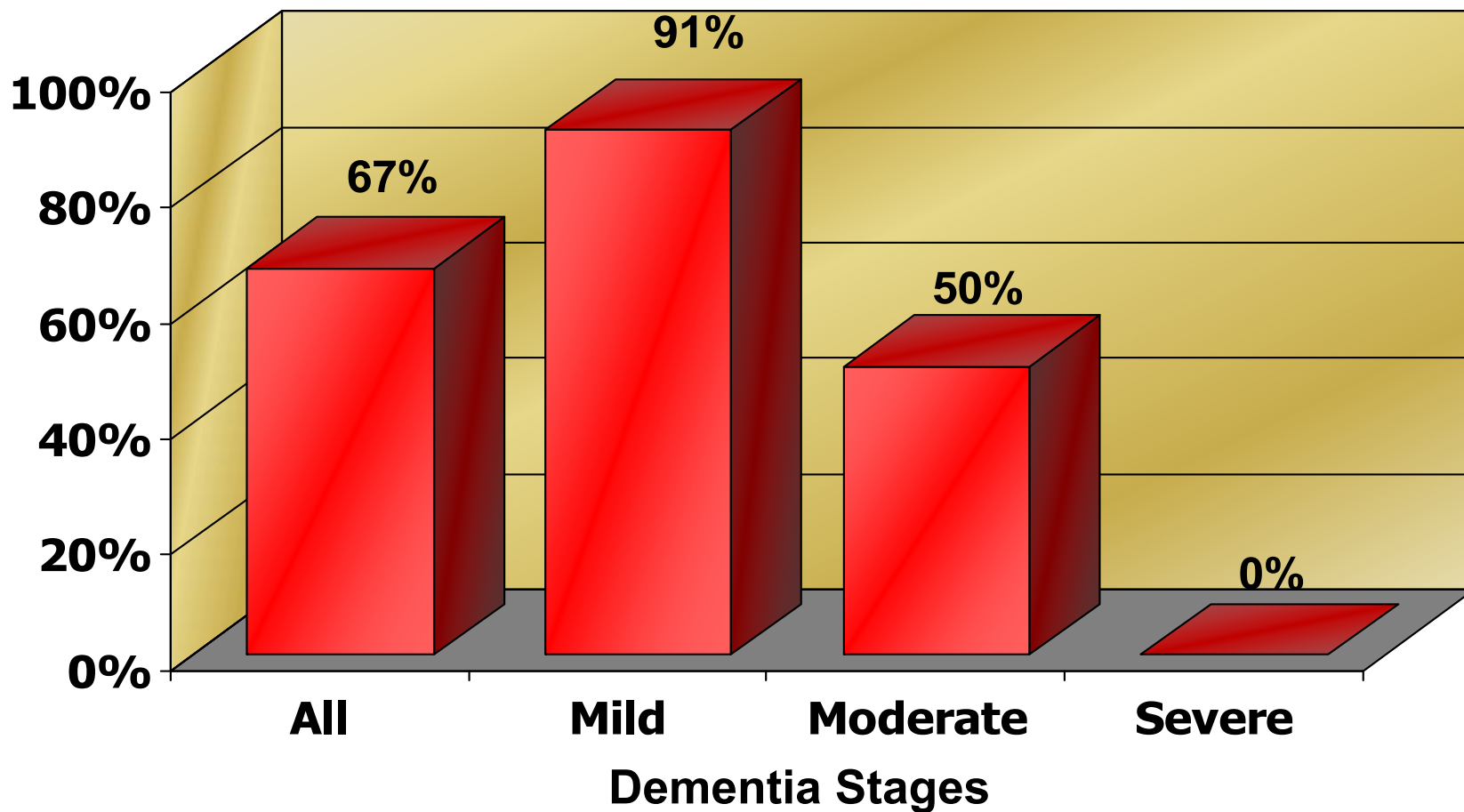
Caregiver Recognition of Memory Problems



Kuakini HAAS – Referral for Evaluation of Memory Problems



Undiagnosed Dementia in Primary Care in Hawaii



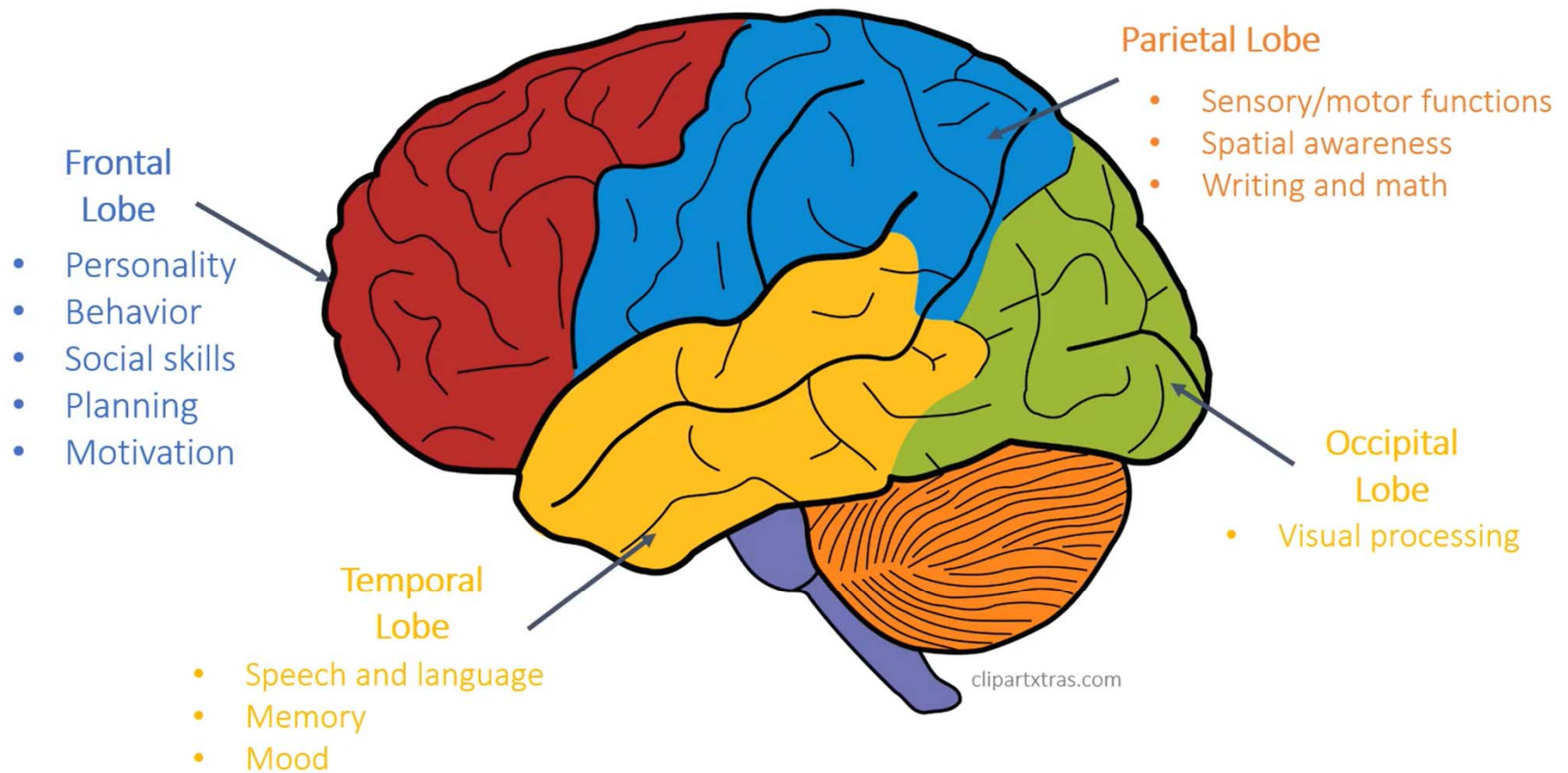
SYMPTOMS OF DEMENTIA



Symptoms

- Memory loss (short-term, then long-term)
- Disorientation (date, place)
- Difficulty with naming and understanding
- Lack of insight, may have depression
- Behavior problems, personality change
- Wandering
- Socially inappropriate, poor judgement

Functions of Cerebral Lobes



Bear, M. F., Connors, B. W., & Paradiso, M. A., (2006) Neuroscience: Exploring the Brain 3rd Ed., Lippincott Williams & Wilkins.

Courtesy: Dr. Christine Ritchie, Harvard Medical School

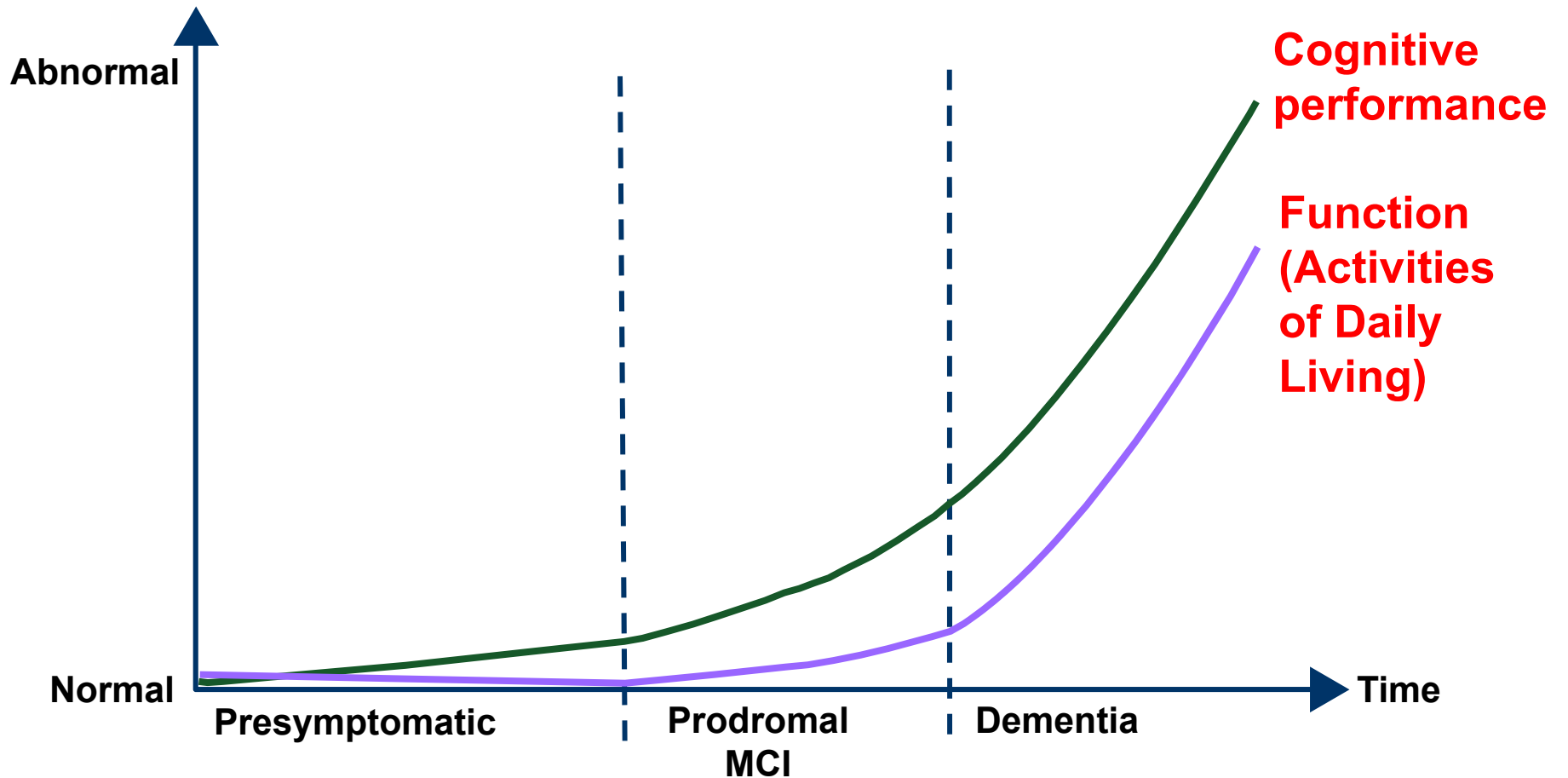
Dementia – The ABCs

- Activities of daily living
- Behavior
- Cognition & intellectual capacity
- Caregiver stress
- Disease progression is inevitable
- Educate patient and caregivers

TREATMENT



Three Stages of AD





Preventive Strategies

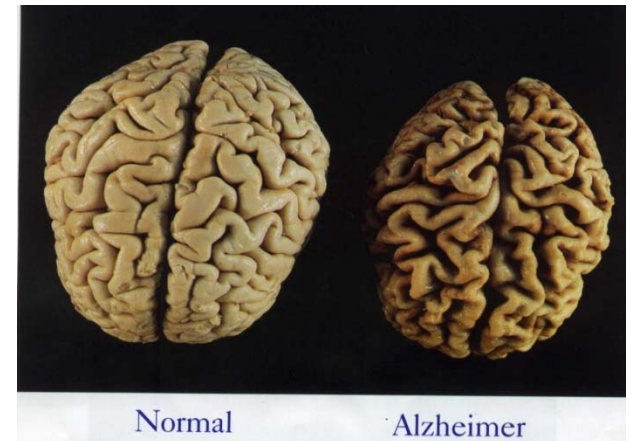
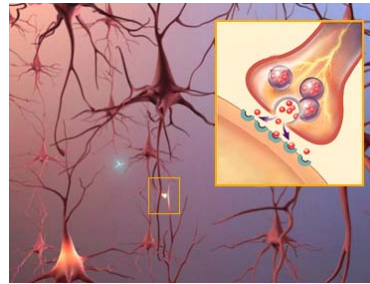
- Preventive measures for the whole population
- Early recognition of people at risk
- Early diagnosis of dementia and treatment of reversible causes

AD FDA-Approved Treatments

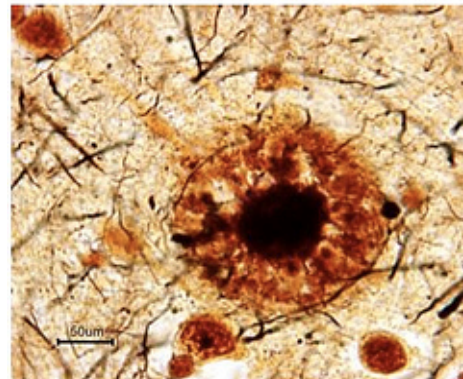
- Cholinesterase Inhibitors:
 - Donepezil (Aricept)
 - Rivastigmine (Exelon)
 - Galantamine (Reminyl / Razadyne)
 - No head to head studies on efficacy
- NMDA-receptor antagonist:
 - Memantine (Namenda)
- Temporary stabilization or slowed decline represent treatment success, patient and family education is key
- Possible reduction in behavioral disturbances

Alzheimer Pathology

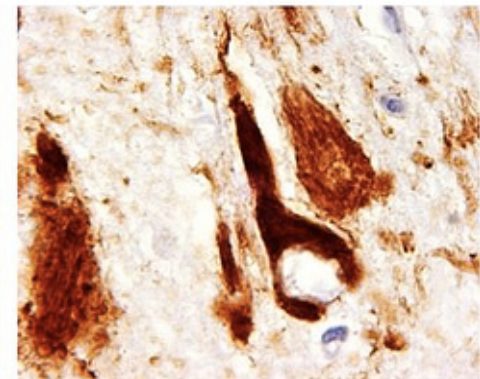
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Plaques



Neurofibrillary Tangles



AD FDA-Approved Treatments

- β -amyloid antibody
- Aducanumab (Adulhelm) → off market
- Lecanemab (Leqembi):
 - Full FDA approval July 2023, clinical benefit shown in early AD (magnitude and duration of benefit not clear)
 - IV infusion every 2 weeks
 - Cost: \$26,500 per year plus
- Diagnosis by Amyloid PET or Lumbar Puncture
- Side Effects: ARIA (Amyloid-related imaging abnormalities) – brain edema and bleeding

The NEW ENGLAND JOURNAL of MEDICINE

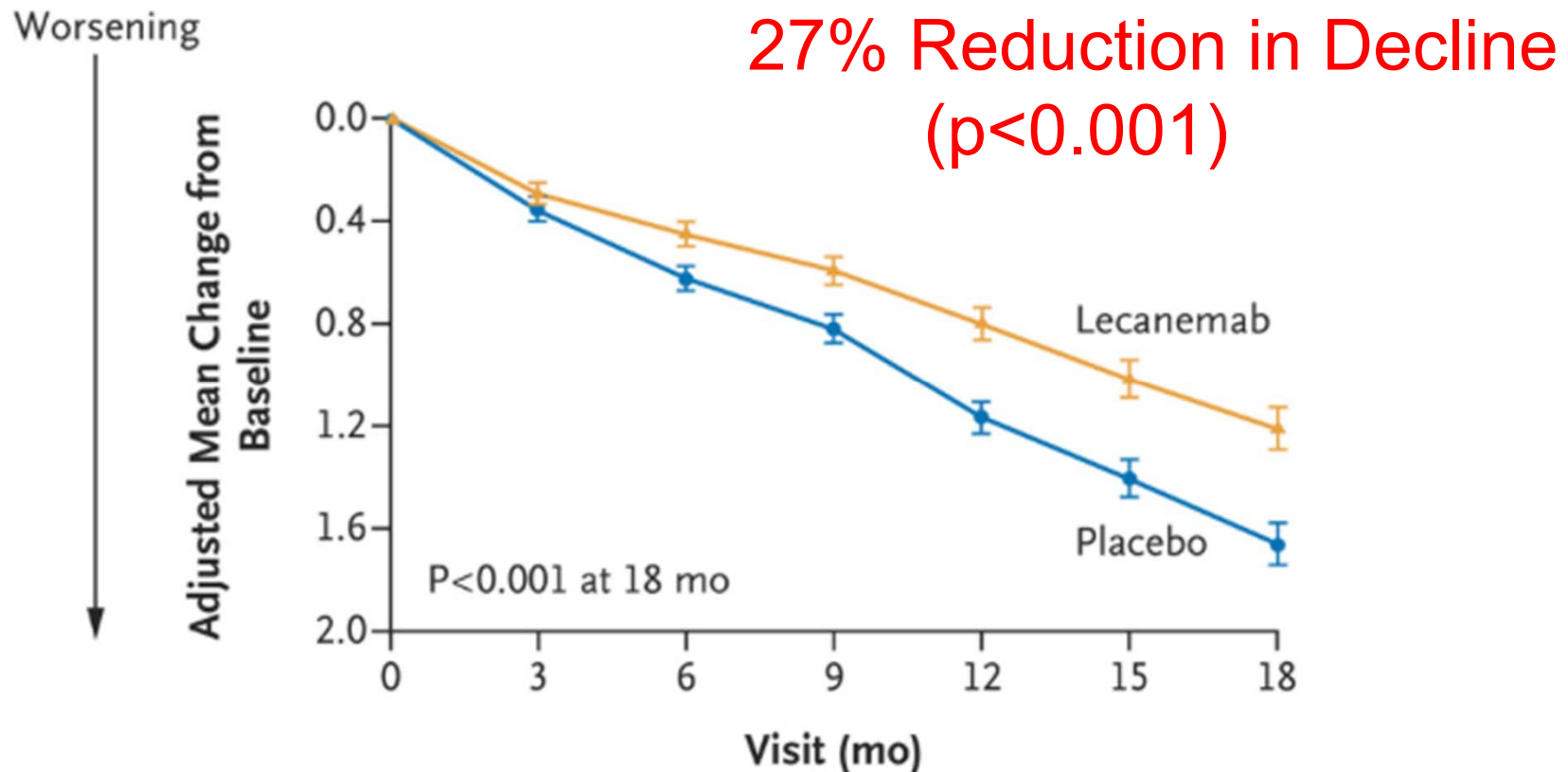
ESTABLISHED IN 1812

JANUARY 5, 2023

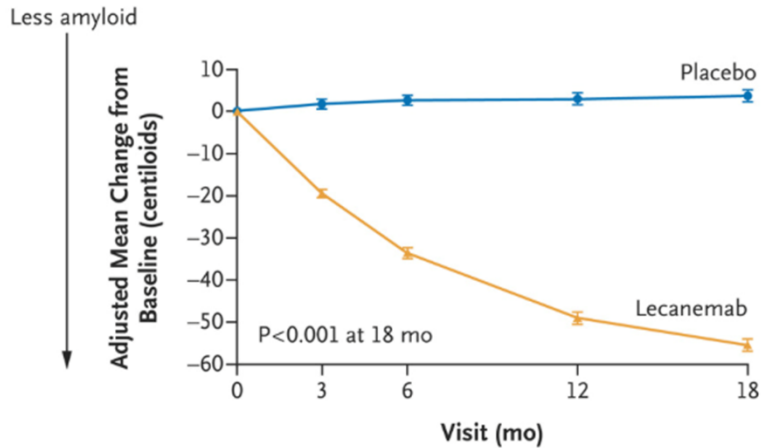
VOL. 388 NO. 1

Lecanemab in Early Alzheimer's Disease

C.H. van Dyck, C.J. Swanson, P. Aisen, R.J. Bateman, C. Chen, M. Gee, M. Kanekiyo, D. Li, L. Reyderman, S. Cohen, L. Froelich, S. Katayama, M. Sabbagh, B. Vellas, D. Watson, S. Dhadda, M. Irizarry, L.D. Kramer, and T. Iwatsubo



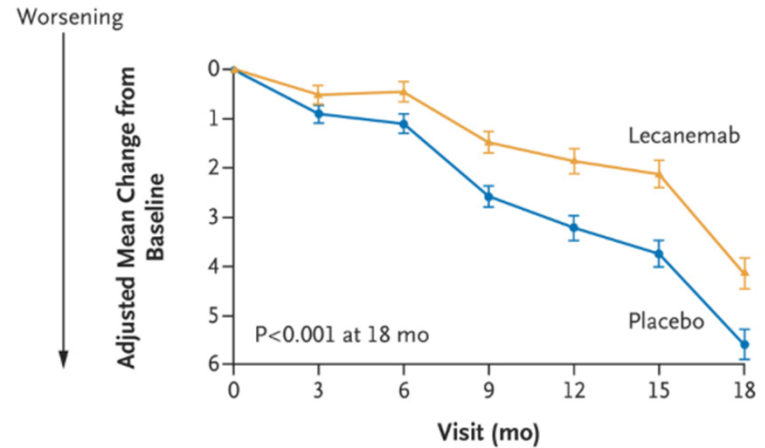
B Amyloid Burden on PET



No. of Participants

Lecanemab	354	296	275	276	210
Placebo	344	303	286	259	205

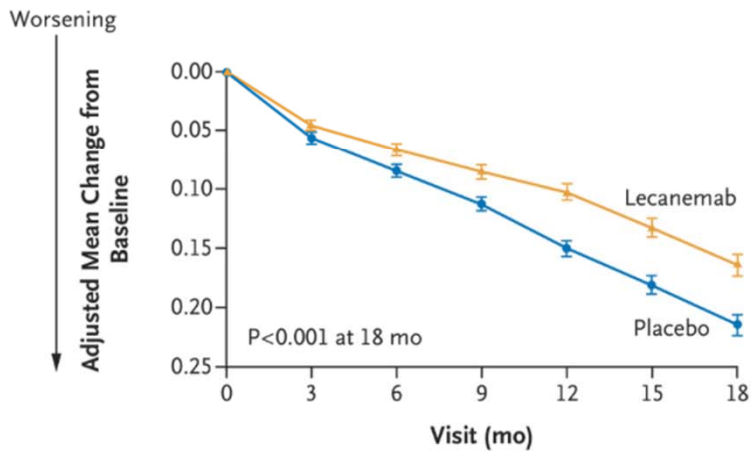
C ADAS-Cog14 Score



No. of Participants

Lecanemab	854	819	793	771	753	730	703
Placebo	872	844	823	807	770	762	738

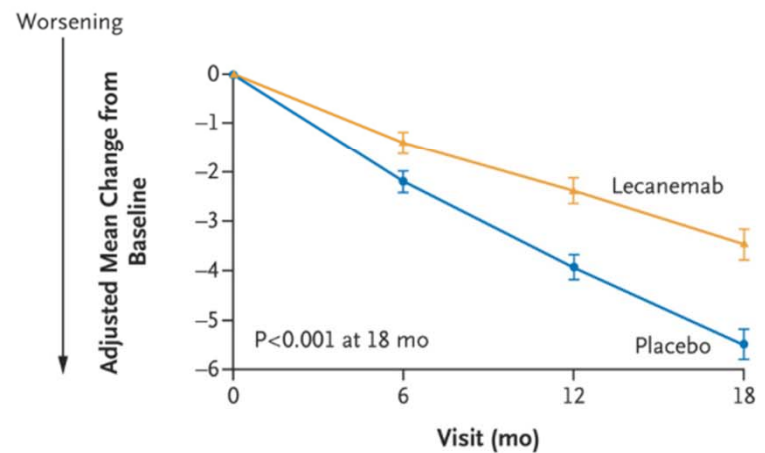
D ADCOMS



No. of Participants

Lecanemab	857	820	796	774	757	733	708
Placebo	875	847	822	808	775	764	749

E ADCS-MCI-ADL Score



No. of Participants

Lecanemab	783	756	716	676
Placebo	796	783	739	707

Safety Issues in Dementia

- Medications – Over and under usage, over-the-counter medications
- Wandering – MedicAlert (Silver Alert bill passed in Hawaii)
- Stove, Water
- Driving
- Risk for elder abuse and neglect
- Financial abuse, sweepstakes



Summary of Treatment Strategies

- Early diagnosis is key
- Treat the cause (if found)
- Treat complications (behavior, sleep)
- Safety, stable environment
- Family education, caregiver support
- Interdisciplinary team approach
- Community resources – AA, EOA
- Planning for future financial / legal issues



Dementia Goals of Care

- Improve quality of life
- Maintain functioning for as long as possible
- Avoid social isolation
- Care for the caregiver

Alzheimer's Association - Aloha Chapter

- Leading source of information on dementia
- Caregiver classes, support groups, community presentations, professional trainings
- Care consultation – assistance with planning, provide counseling services
- MedicAlert
- TrialMatch[®] – Clinical trials matching service

Alzheimer's Association, Aloha Chapter

Tel: (808) 591-2771 | Fax: (808) 591-9071

www.alz.org/hawaii 1-800-272-3900



Mahalo!
Questions?