

Mild Cognitive Impairment & Dementia

Dr. Ritabelle Fernandes

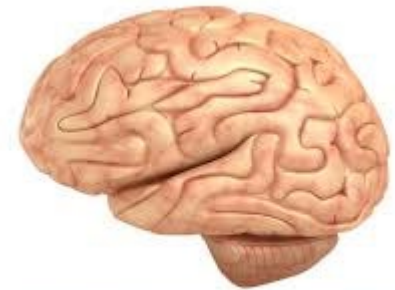
Associate Professor

JABSOM, UH



Brain and Normal Aging

- ◆ Slowing of Neurons
- ◆ Intelligence remains the same
- ◆ Word finding difficulties - - Whatchumay call it?
- ◆ Mental flexibility reduces
 - Unable to multitask
- ◆ Mild short term memory loss
 - not affecting activities of daily living



Aging Changes in Cognition

Reading

Vocabulary

Long term factual memory

Immediate memory span

Sustained attention

Serial (practice-related) learning

Delayed recall

Motor speed

Visuo-spatial skills

Least change

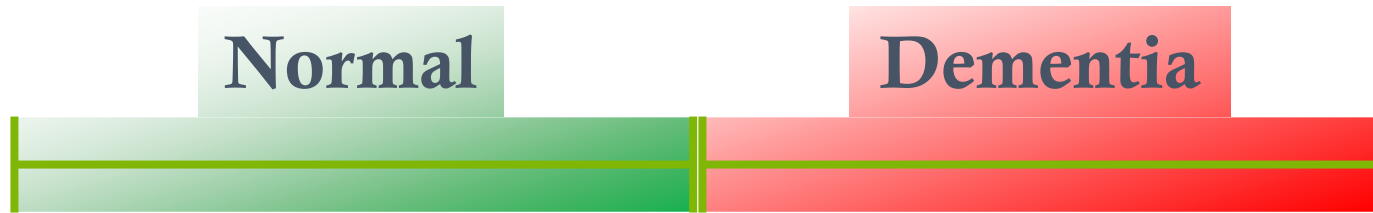


Most change

Normal (Healthy) Aging

- ◆ Independence in daily activities **preserved**
 - ◆ Can operate common appliances
 - ◆ Balance checkbook, pay bills, manage finances
 - ◆ Manage medications
 - ◆ Drive safely
 - ◆ Grocery shop, prepare meals
 - ◆ Keep track of appointments, daily schedule
- ◆ Can live independently
- ◆ Memory intact for recent events
- ◆ Normal performance on memory screening

Cognitive Continuum



MCI Concept Defined

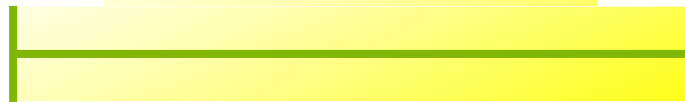
- ◆ Can changes in memory be detected prior to the onset of dementia?
 - ◆ MCI diagnosis could identify people at risk of dementia
 - ◆ Patients with MCI potentially useful group for research
- ◆ What is boundary between normal aging and dementia?
 - ◆ Assume middle (transitional) stage
 - ◆ Conflicting terms in the literature (cognitive decline, isolated memory impairment, insipient dementia)
- ◆ **Ron Petersen, MD**
 - ◆ Mayo Clinic, Minnesota

Cognitive Continuum

Normal



Mild Cognitive
Impairment



Dementia



MCI Concept Defined

- ◆ Characterized by mild but **measureable** changes in thinking ability
 - ◆ Person is having symptoms
 - ◆ Symptoms can be detected with cognitive testing
- ◆ MCI distinguished from dementia because individual retains ability to carry out everyday activities
 - ◆ But, how is this defined?
 - ◆ How is this ability evaluated or measured?

MCI Diagnostic Criteria

1. Someone is concerned about the patient's cognitive status:
 - ◆ Patient
 - ◆ Family member / informant
 - ◆ Healthcare provider
2. Objective evidence of impairment in 1 or more cognitive domains
 - ◆ Performance compared to thousands of healthy individuals of the same age and level of education
3. General maintenance of independent function in daily life with minimal assistance
4. No dementia
 - ◆ No significant impairment in social or occupational functioning

Subtypes of MCI

Amnestic MCI

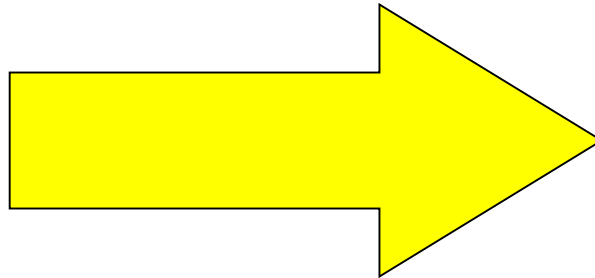
- ◆ Most common form
- ◆ Memory is the primary problem

Non-amnestic MCI

- ◆ Memory is more or less intact
- ◆ Some other thinking ability is impaired
 - ◆ Language
 - ◆ Visuospatial (the brain's GPS system)
 - ◆ Executive functioning (reasoning, problem solving, paying attention)

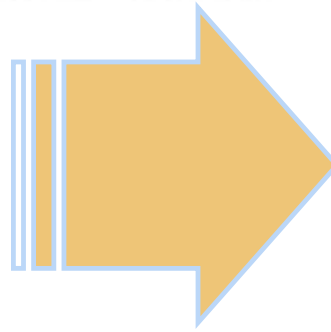
Conversion Rates from MCI to AD

5+
Years



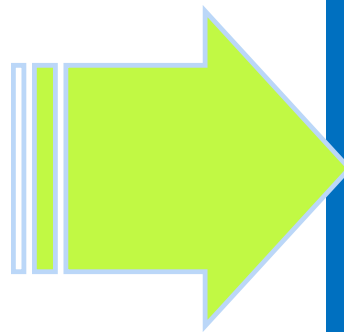
>50%

**Amnestic
MCI**



Alzheimer's disease

**Non-Amnestic
MCI**



Frontotemporal dementia
Primary progressive aphasia
Lewy body dementia
Parkinson's disease
Alzheimer's disease

Diagnostic Challenges

- ◆ Many family practice physicians unsure how to distinguish MCI from dementia
- ◆ New criteria since 2011 – can take up to 10+ years to implement broadly
- ◆ In some areas, over-reliance on MCI dx
 - ◆ Hesitation to say AD
 - ◆ “AD of the MCI type”
- ◆ Actual functional skills vary widely
- ◆ Medication treatment of MCI is controversial

Dementia Prevalence

More than
5 million
Americans
are living with
Alzheimer's



1 in 3
seniors
dies with
Alzheimer's
or another
dementia

It kills more
than breast
cancer and
prostate
cancer
combined

By 2050, the number
of people age 65 and
older with Alzheimer's
dementia is projected
to reach **13.8 million**.

Dementia is not a part of normal aging

Not everyone who grows old will develop dementia



#s in U.S.

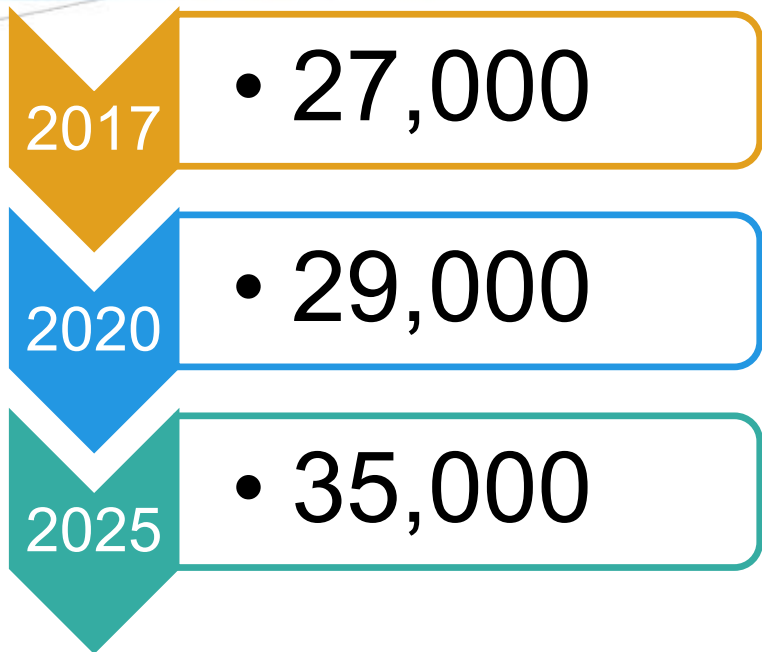
vs.

Hawaii

ALZHEIMER'S DISEASE IS THE
6TH LEADING CAUSE
OF DEATH IN THE UNITED STATES

MORE THAN
5 MILLION
AMERICANS ARE
LIVING WITH
ALZHEIMER'S
BY 2050, THIS
NUMBER COULD
RISE AS HIGH AS
16 MILLION

EVERY
66
SECONDS
someone in the
United States
develops the disease



Hawaii figures do not include those who are undiagnosed. It's estimated that approximately 60-80% go undiagnosed. Alzheimer's Association, Facts and Figures, 2018

Tip of the Iceberg!



Normal Aging

10 Early Signs and Symptoms

Sometimes forgetting names or appointments but remembering them later

Memory loss that disrupts daily life

Making occasional errors when balancing a checkbook

Challenges in planning or solving problems

Needing occasional help to use the settings on a microwave or to record a TV show

Difficulty completing familiar tasks at home, at work or at leisure

Confused about the day of the week but recalling it later

Confusion with time or place

Vision changes related to cataracts

Trouble understanding visual images and spatial relationships

Normal Aging (con't)

10 Early Signs and Symptoms (con't)

Sometimes having trouble finding the right word

New problems with words in speaking or writing

Misplacing things from time to time and retracing steps to find them

Misplacing things and losing the ability to retrace steps

Making a bad decision once in a while

Decreased or poor judgment

Sometimes feeling weary of work, family and social obligations

Withdrawal from work or social activities

Developing very specific ways of doing things and becoming irritable when a routine is disrupted.

Changes in mood and personality

Many Causes of Dementia

- ◆ **Alzheimer's disease**
- ◆ Stroke
- ◆ Parkinson's disease
- ◆ HIV / AIDS
- ◆ Multiple Sclerosis
- ◆ Huntington's disease
- ◆ Lewy Body dementia
- ◆ Frontotemporal dementia
- ◆ Creutzfeldt-Jakob disease
- ◆ Traumatic brain injury
- ◆ Toxic exposures
- ◆ Chronic hypoxia
- ◆ Syphilis
- ◆ Brain tumors
- ◆ Normal pressure hydrocephalus
- ◆ Wernicke-Korsakoff's Syndrome

Flowers

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graph TD; Flowers[Flowers] --> Orchid[Orchid]; Flowers --> Heliconia[Heliconia]; Flowers --> Plumeria[Plumeria]; Flowers --> BirdOfParadise[Bird of Paradise]; Flowers --> Hibiscus[Hibiscus];
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Orchid

Heliconia

Plumeria

Bird of Paradise

Hibiscus

Dementia

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graph TD; Dementia --> Frontotemporal_dementia; Dementia --> Vascular_dementia; Dementia --> Alzheimer's_dementia; Dementia --> Lewy_body_dementia; Dementia --> Parkinson's_dementia;
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Frontotemporal
dementia

Vascular dementia

Alzheimer's dementia

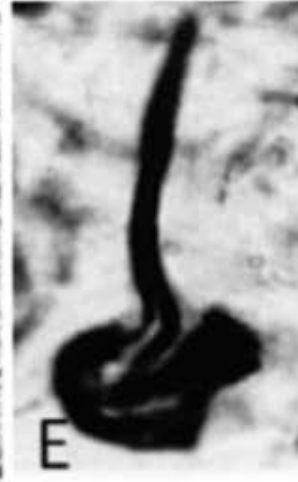
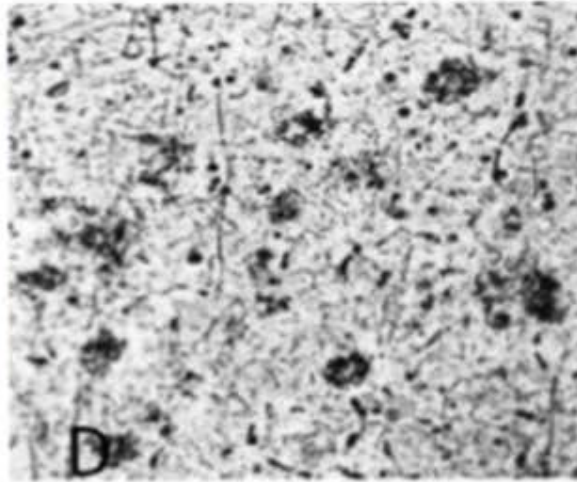
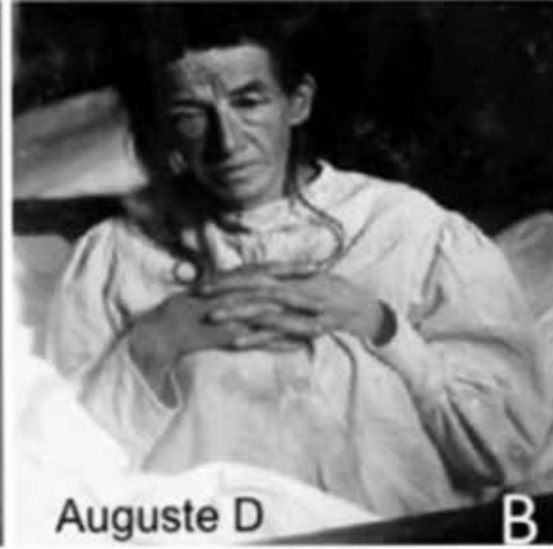
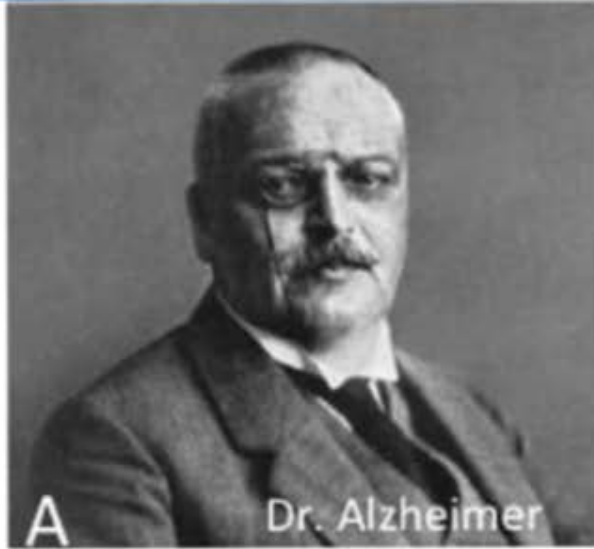
Lewy body dementia

Parkinson's
dementia

What is Alzheimer's Disease?

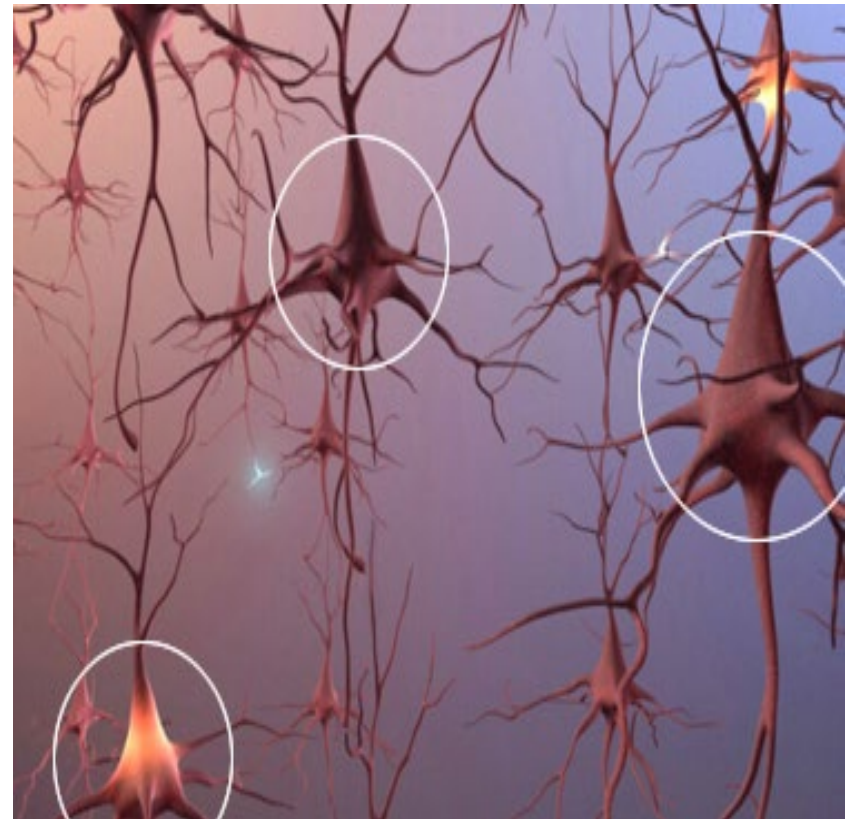


<http://youtu.be/ECbjK4Ra-Ys>



AD: What does it look like?

- Neurofibrillary tangles
- Amyloid plaques
- Decrease in chemicals that facilitate memory
- Cell death



Cell Death: Brain Shrinkage

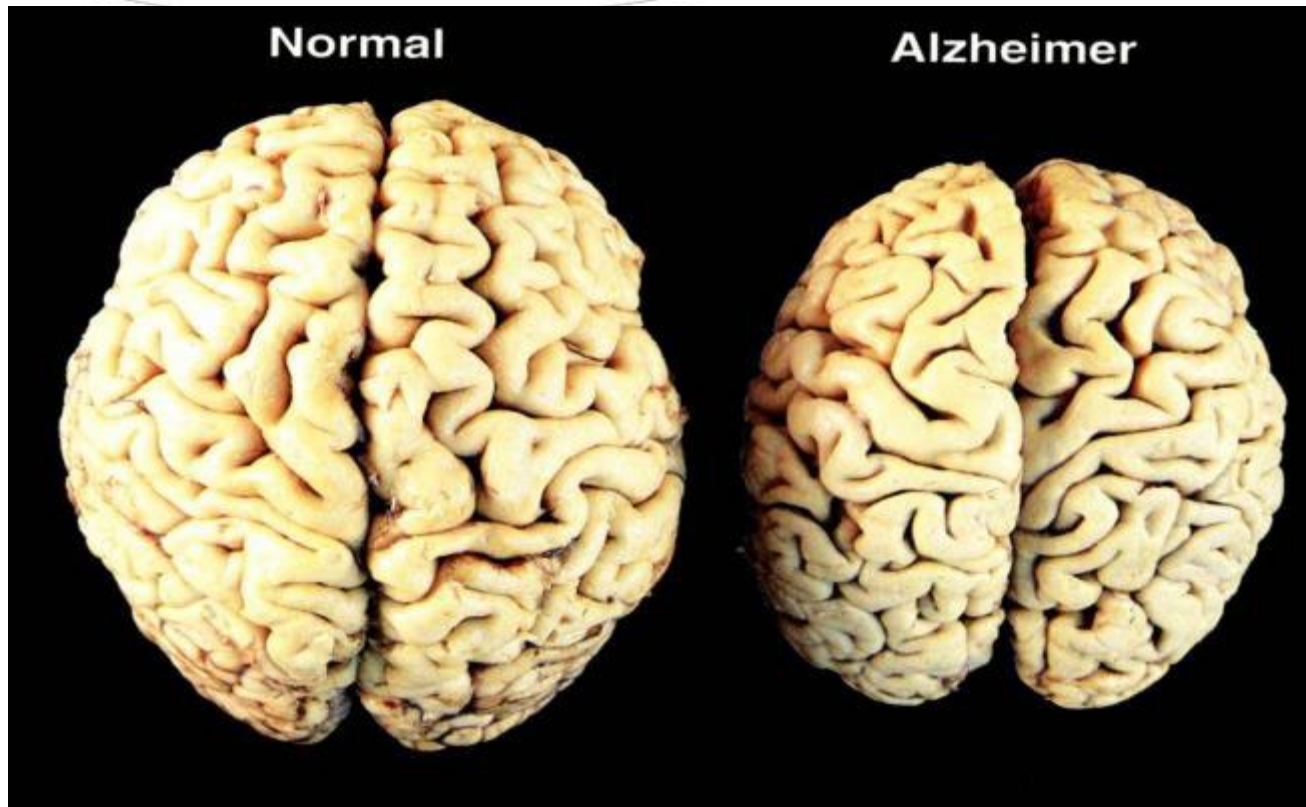
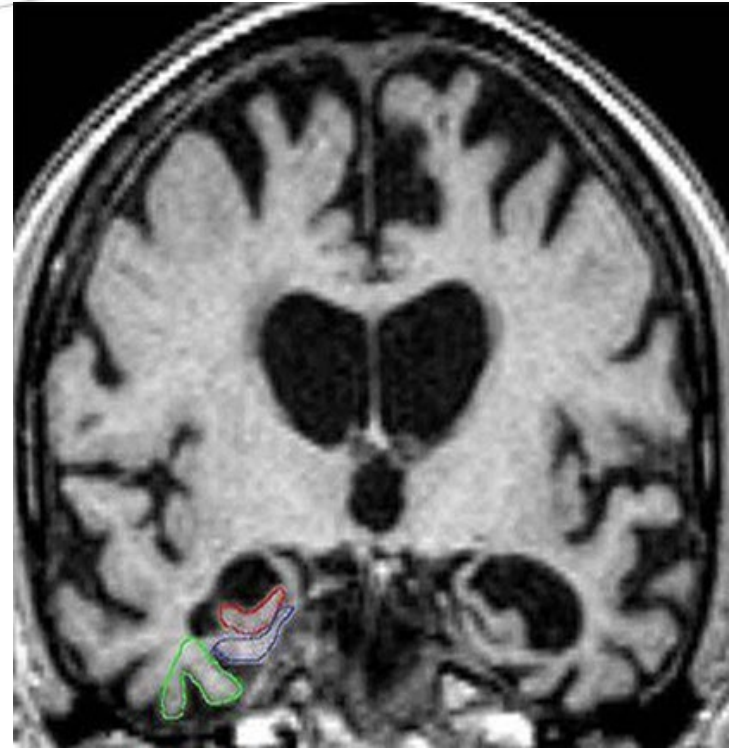


Image appears courtesy of Dr. Richard E. Powers,
Director of the Alabama Bureau of Geriatric Psychiatry, alzbrain.org

CT Scan Brain



Risk Factors of Dementia

- ◆ **Age**
- ◆ Family history
- ◆ Genetics
- ◆ Cerebrovascular disease
 - ◆ High blood pressure
 - ◆ High cholesterol
 - ◆ Diabetes
 - ◆ Smoking
 - ◆ Obesity
 - ◆ Heart attack
 - ◆ Stroke
- ◆ Female gender
- ◆ African American and Hispanic / Latino ethnicity
- ◆ Traumatic brain injury
- ◆ Low level of education
- ◆ Mild Cognitive Impairment (MCI) diagnosis
- ◆ Down Syndrome

Stages of Alzheimer's Disease

Early Stage	Middle Stage	Late Stage
<ul style="list-style-type: none">• Confusion and memory loss• Disorientation in space• Problems with routine tasks• Changes in personality and judgment	<ul style="list-style-type: none">• Difficulties with ADLs• Anxiety, paranoia, agitation and other compromising behaviors• Sleep difficulties• Difficulty recognizing familiar people	<ul style="list-style-type: none">• Loss of speech• Loss of appetite, weight loss• Loss of bladder and bowel control• Loss of mobility• Total dependence on others• Death



Dementia Friends Hawaii



A Dementia Friendly America initiative

- ◆ Dementia is not a normal part of aging. Not everyone who grows old will develop dementia
- ◆ Dementia is caused by diseases of the brain. The most common is Alzheimer's disease
- ◆ Dementia is not just about having memory problems. It can affect thinking, communication and doing everyday tasks
- ◆ It is possible to have a good quality of life with dementia
- ◆ There's more to the person than the dementia. People with dementia are a valuable part of the community