Alzheimer's Disease and What All of Us Should Know

Life in the Word Worship Center

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Presentation Agenda

- AD and Dementia: The Difference
- Early Detection
- Why Study Genetics of AD
- Prevention
- AD Support and Going Forward

Begin with the End in Mind

Alzheimer's is present among all races, ethnicities, socioeconomic classes, geographic regions, political affiliations, religions. It is just more prevalent in some

All of Us Can Help Find the Answers!

Most common form of dementia

Primary risk factor: age

Every 65 seconds

No cure

No Drug to Slow Progression

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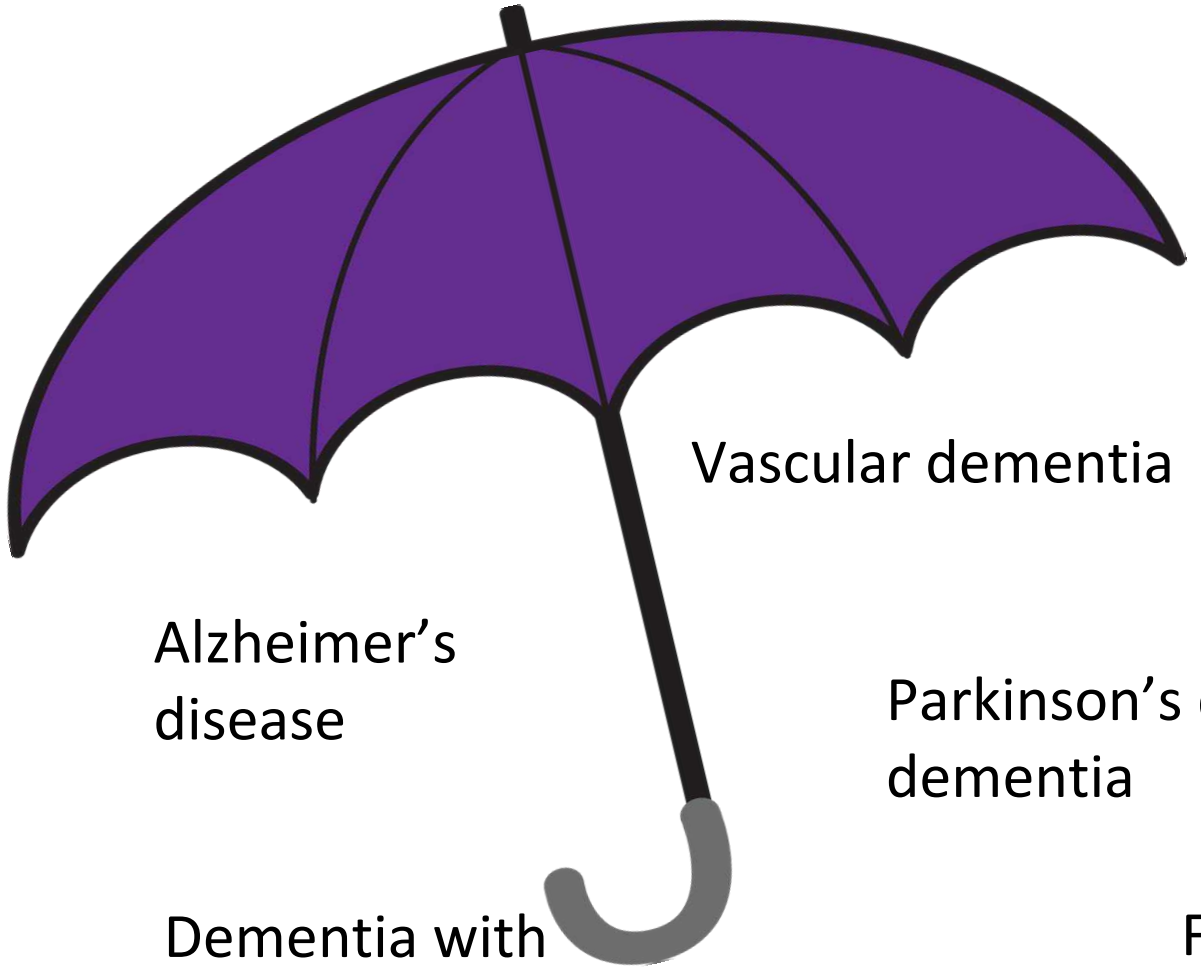
Dementia Is An Umbrella Term



Mixed dementia

Vascular dementia

Alzheimer's disease

Parkinson's disease dementia

Corticobasal degeneration

Dementia with Lewy body's

Frontotemporal dementia

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A Few Statistics about Alzheimer's

6th

Leading cause of death in the U.S. and 5th in N.C.

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Significant Increase in Alzheimer's Expected in NC

Year	Ages 65 - 74	Ages 75 - 84	Ages 85+
2015	25,000	69,000	63,000
2020	31,000	79,000	69,000
2025	35,000	100,000	77,000

Source: alz.org 2016 *Facts and Figures*

A Few Statistics about Alzheimer's

5+
million

Americans living with the disease

1 in 8

Baby boomers will be diagnosed in their lifetime

A Few Warning Signs

a) Getting upset, worried, and angry more easily
b) Hiding things or believing other people are hiding things
c) Imagining things that aren't there
d) Wandering away from home
e) Excessive pacing
f) Repeating the same thing over and over
g) Unusual sexual behavior
h) Increased violent behavior
i) Misunderstanding what he or she hears
j) No interest in how he or she looks (e.g. stops bathing, wears the same clothes every day).
k) Increased feelings of sadness, fear, stress, confusion, or anxiety

- Suspected risks:
  - Heart disease
  - High blood pressure at mid-life
  - Lack of physical activity
  - Depression
  - Diabetes

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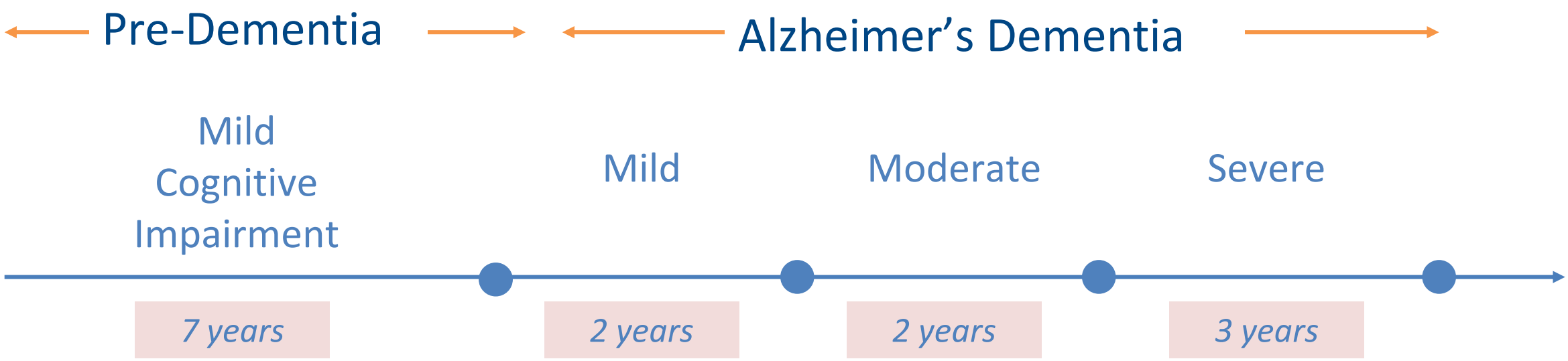
Progression



Courtesy: Dr. Rahn Bailey Wake Forest Medical Center

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Progression

Pre-Dementia → Alzheimer's Dementia →

Mild Cognitive Impairment | Mild | Moderate | Severe

Memory Loss
Confusion of Familiar places
Taking longer to accomplish tasks

Trouble with paying bills
Poor Judgment
Loss of initiative

Courtesy: Dr. Rahn Bailey Wake Forest Medical Center

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Progression

Pre-Dementia → Alzheimer's Dementia →

Mild Cognitive Impairment | Mild | Moderate | Severe

Increased Memory loss
Shortened Attention Span
Inappropriate outbursts of anger
Problems recognizing friends

Difficulty with language
Difficulty organizing thoughts
Restlessness, agitation, tearfulness,
Repetitive statements or movements

Courtesy: Dr. Rahn Bailey Wake Forest Medical Center

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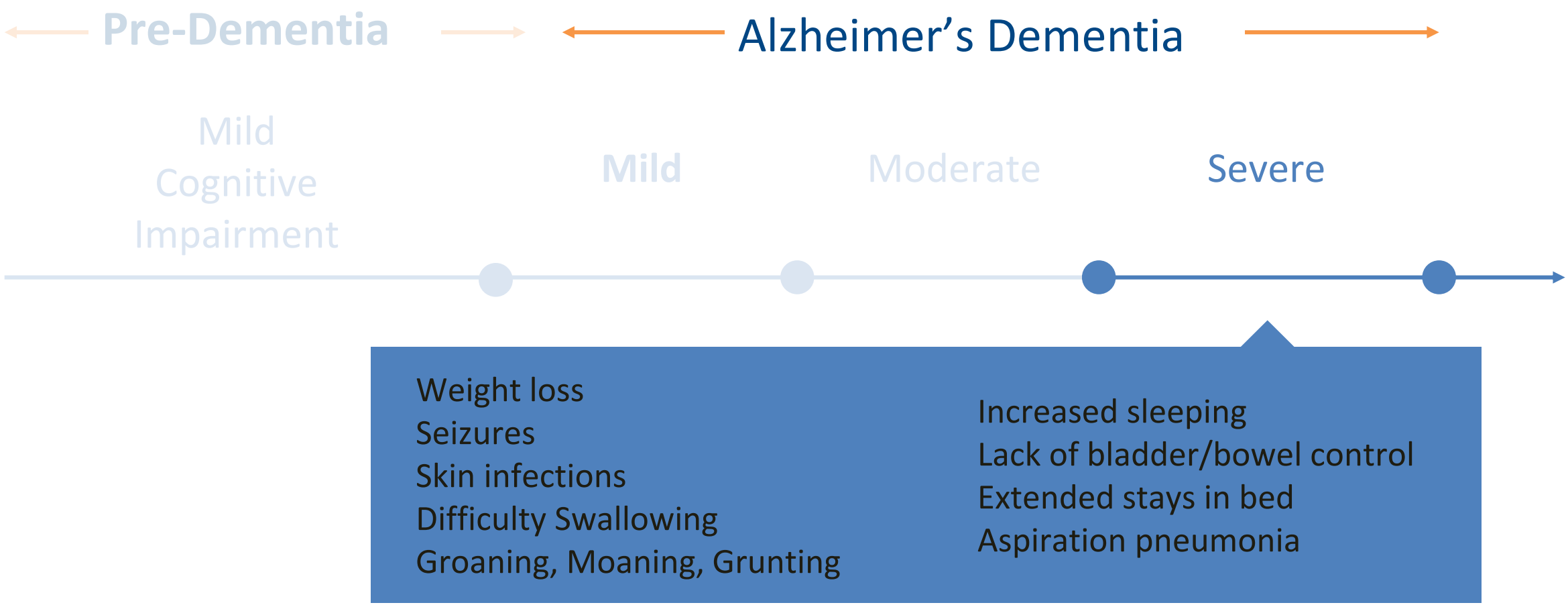
Progression



Courtesy: Dr. Rahn Bailey Wake Forest Medical Center

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EARLY DETECTION

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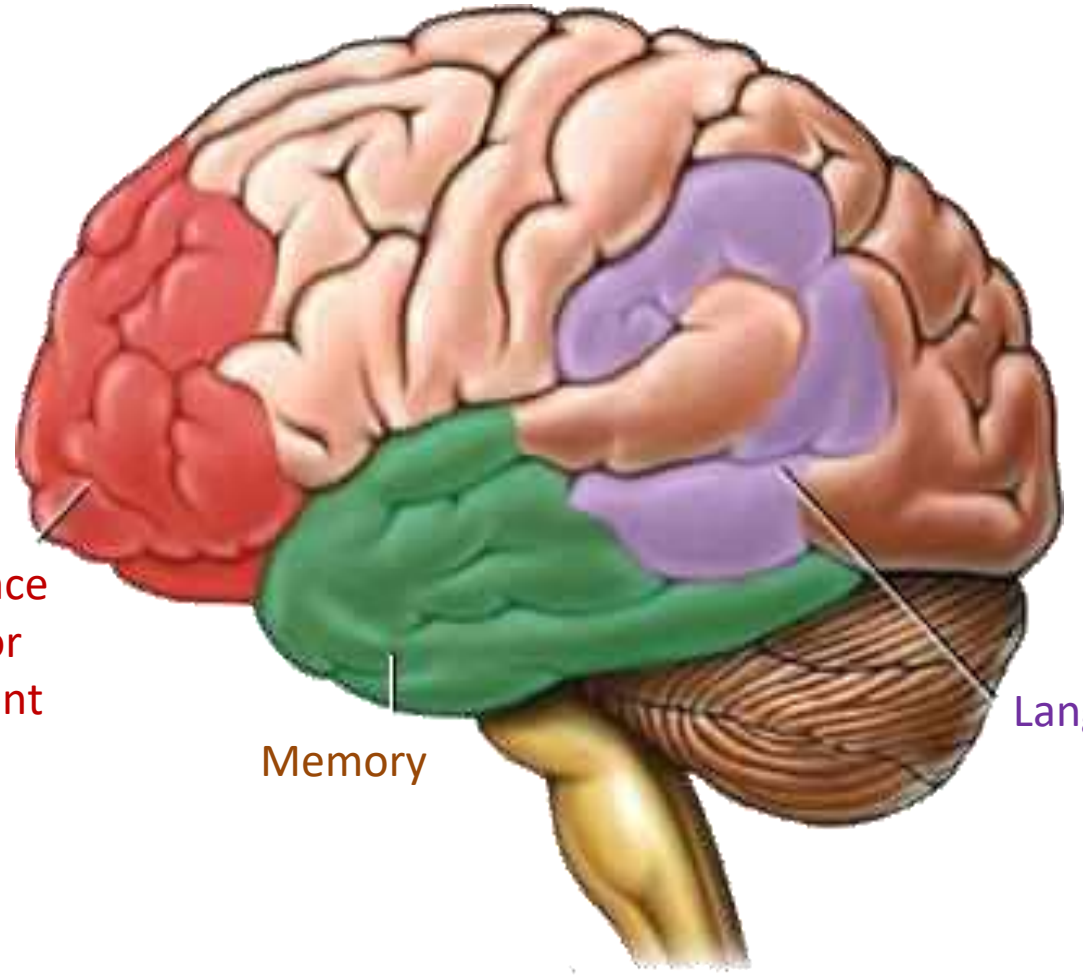
ALZHEIMER'S DISEASE AFFECTS MULTIPLE AREAS OF THE BRAIN



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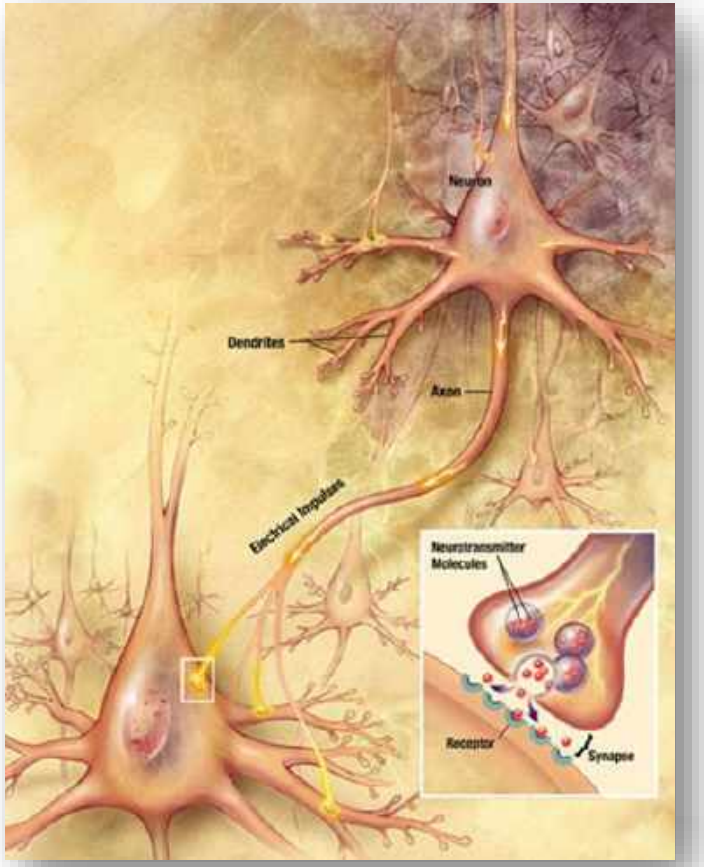
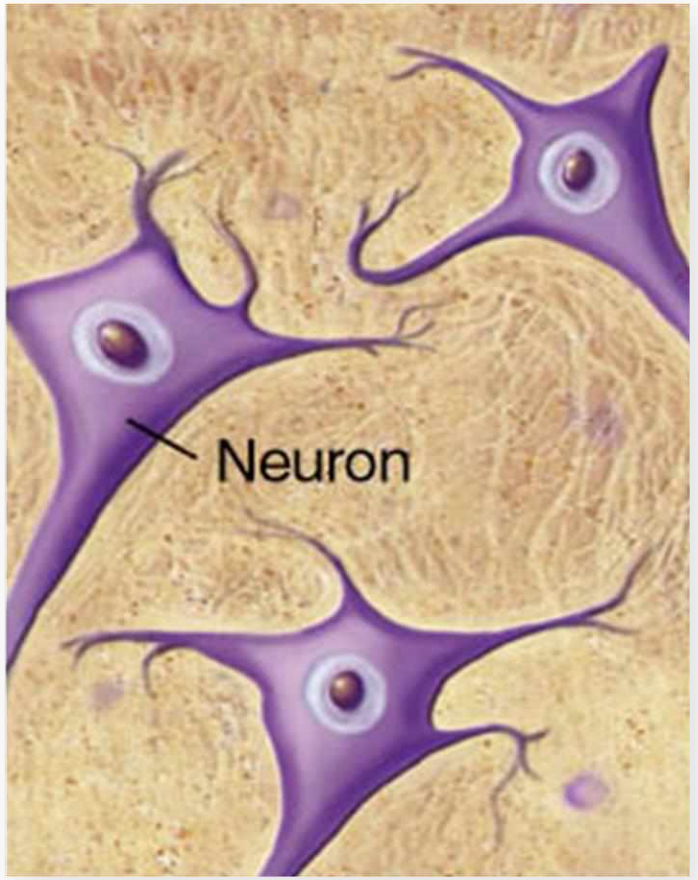
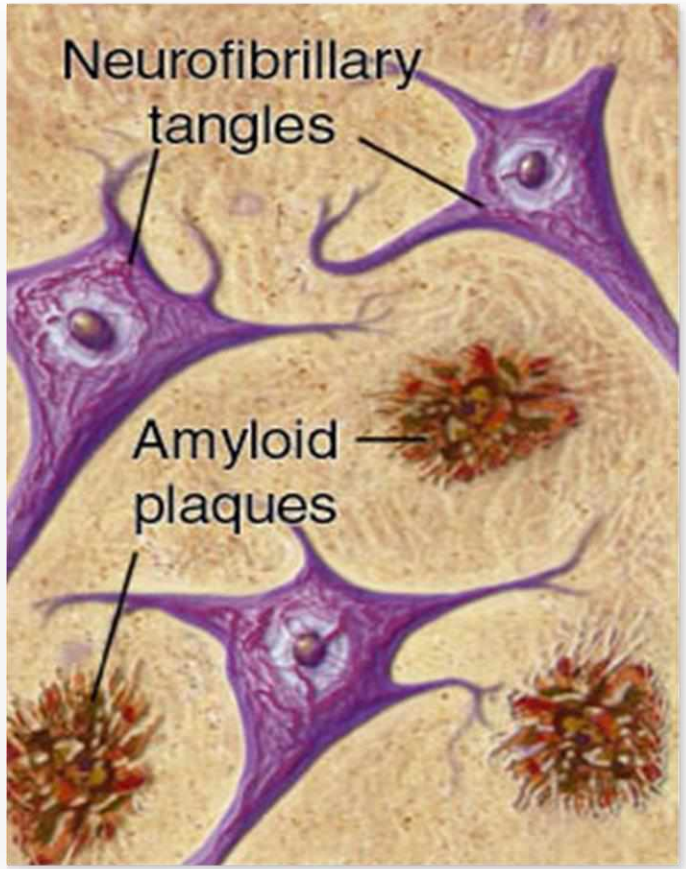
ALZHEIMER'S DISEASE DESTROYS BRAIN CELLS THAT ***DO NOT*** COME BACK!



Crosstalk between Neurons



Normal Neurons



Diseased Neurons

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Biological Markers

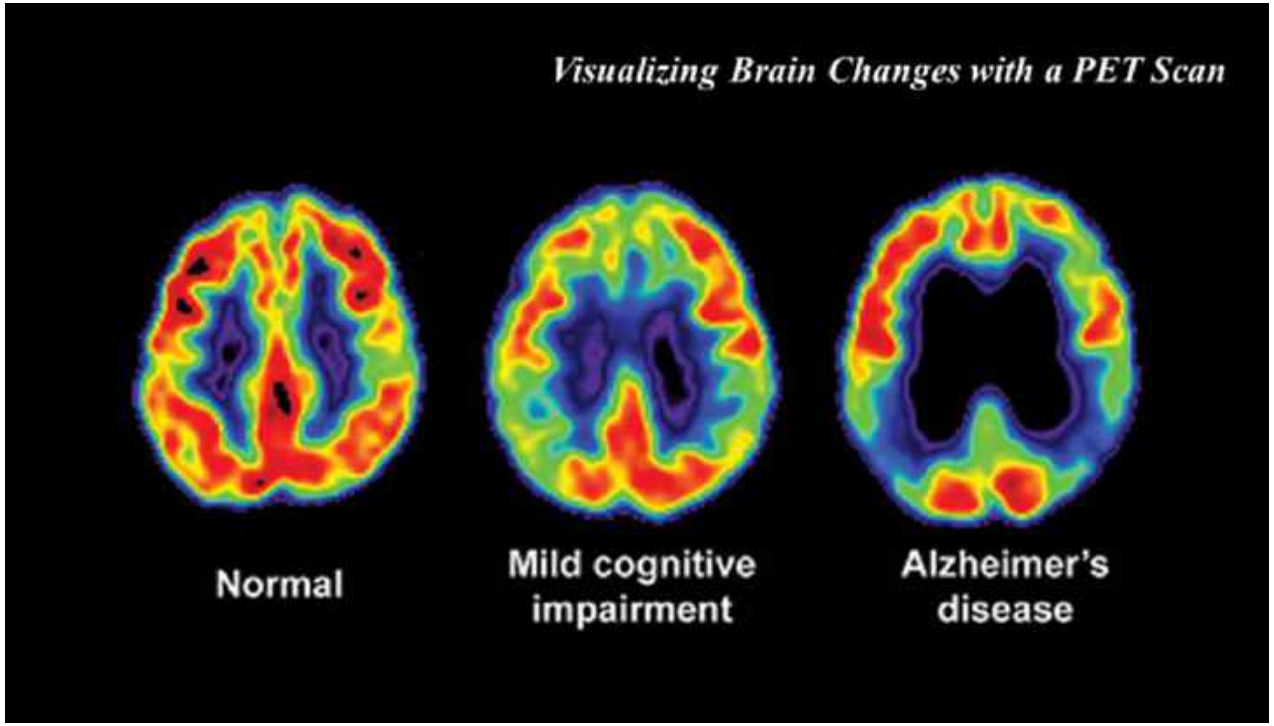
- Biomarkers

- Can be measured to accurately and reliably indicate the presence of disease
  - fasting blood glucose (blood sugar) level, which indicates the presence of diabetes if it is 126 mg/dL or higher.

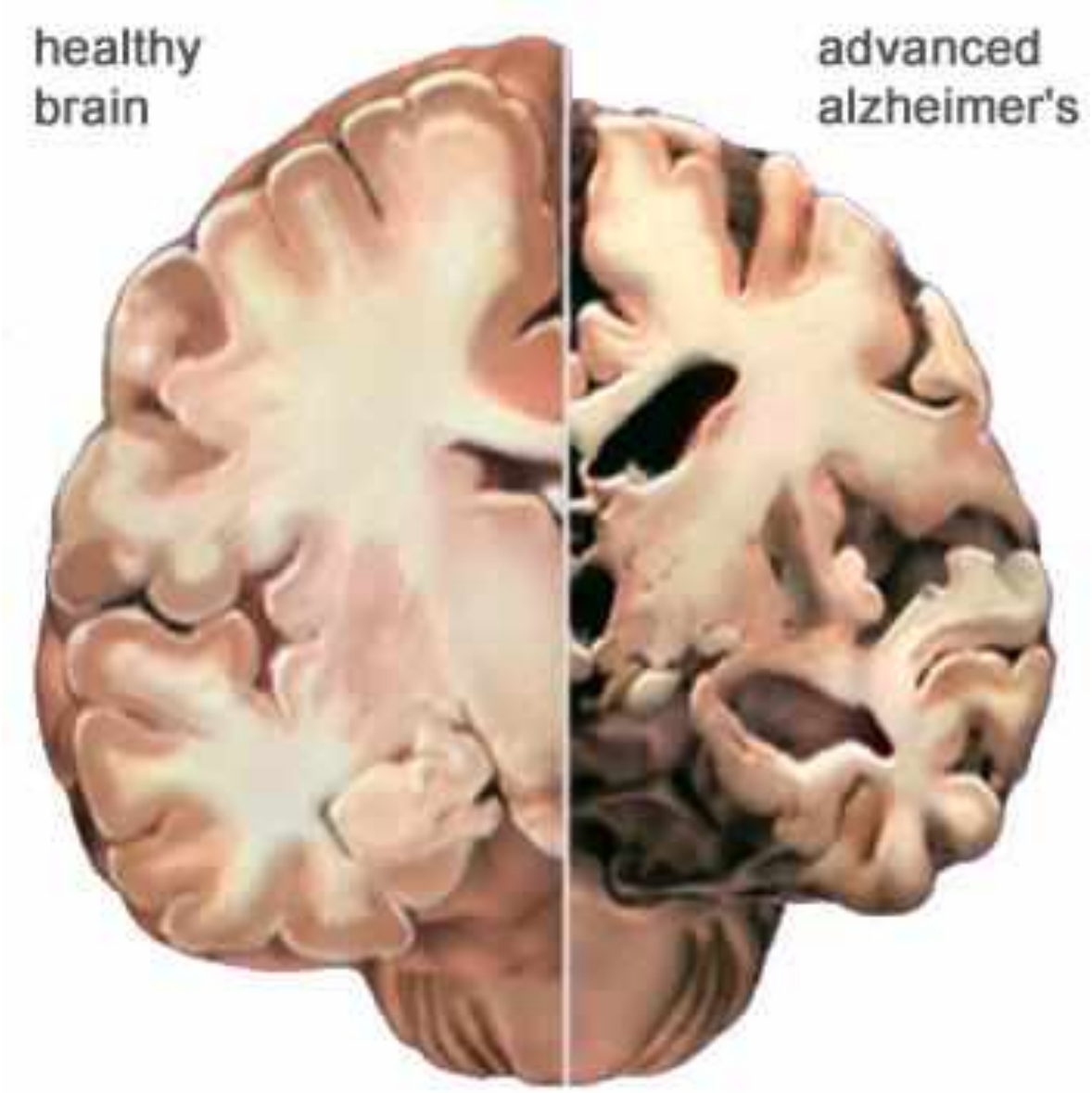
- Several potential biomarkers are being studied
  - beta-amyloid and tau levels in cerebrospinal fluid (CSF)
  - Blood and urine test
  - brain changes detectable by imagining

Brain Imaging/Neuroimaging

- Magnetic Resonance Imaging (MRI) and computed tomography (CT) scan
  - provides information about the shape, position or volume of brain tissue.
- Positron Emission Tomography (PET)
  - reveals how well cells in various brain regions are working by showing how actively the cells use sugar or oxygen



Death of a Healthy Brain
Due to Alzheimer’s Disease



Annual Check-UP

- Annual Check up
  - Vital Check signs
    - BP, heart rate and respiratory rate
  - Physical Exam
    - palpating," parts of your body (like your abdomen) to feel for abnormalities
    - checking skin, hair, and nails
    - possibly examining your genitalia and rectum
    - testing your motor functions and reflexes
  - Visual Exam
    - Head, eyes, chest, muscoskeletal system and nervous system
  - Cognitive Exam
    - Memory
    - Executive functions
    - Delayed recall
    - Immediate recal

GENETICS OF AD

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Dr. Francis Collins:

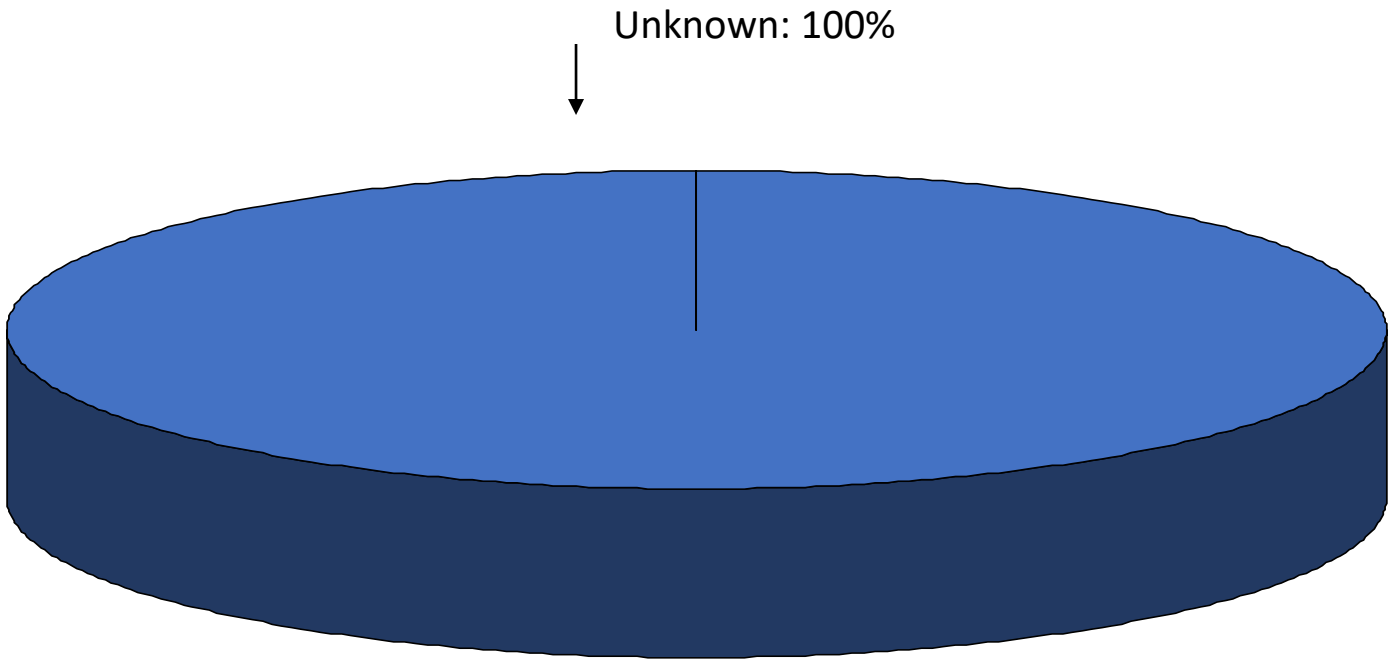
"Except for some cases of trauma, it is fair to say that virtually every human illness has a hereditary component".

Collins FS (1999) Shattuck Lecture: medical and societal consequences of the Human Genome Project. *N Engl J Med*. 1999; 341:28-37

ALZHEIMER'S DISEASE RUNS IN *OUR* FAMILIES

- ALZHEIMER'S RUNS IN OUR FAMILIES

AD Genetics: 1988



Late Onset Alzheimer's was not thought to have a genetic component until…

The discovery of *ApoE* as a genetic risk factor in Alzheimer Disease revolutionized the field of complex disease genetics

Gene hunters. The Duke team *(left to right)*: Warren Strittmatter, Allen Roses, Guy Salvesen, Ann Saunders, John Gilbert, Margaret Pericak-Vance, Mark Alberts, Elizabeth Corder, and Donald Schmechel.

Gene Dose of Apolipoprotein E Type 4 Allele and the Risk of Alzheimer's Disease in Late Onset Families

E. H. Corder, A. M. Saunders, W. J. Strittmatter, D. E. Schmechel, P. C. Gaskell, G. W. Small, A. D. Roses, J. L. Haines, M. A. Pericak-Vance*

SCIENCE • VOL. 261 • 13 AUGUST 1993

Apolipoprotein E (APOE) Gene

- Gene identified in 1993 by Dr. Pericak-Vance and colleagues
- APOE protein is involved in cholesterol storage, transport, and metabolism
- Most common known genetic determinate of susceptibility to AD
- Found in both familial and sporadic AD
- **Risks are sex and race dependent:** APOE has a smaller effect on African Americans than in individuals of European heritage.

We all inherit 2 forms or copies of the APOE gene

GOOD COPY

it appears to decrease risk, and increases age of onset

NEUTRAL COPY

it is the most common form

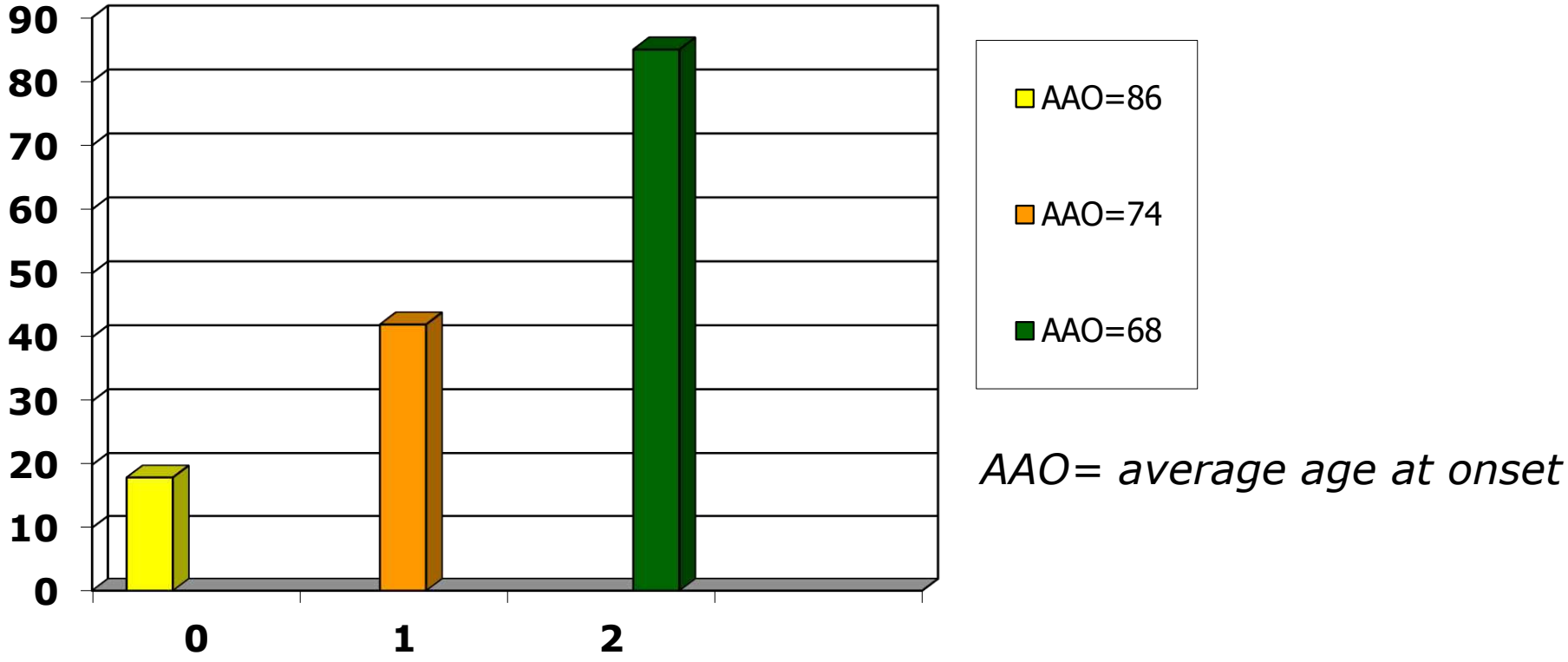
neither increases nor decreases risk

BAD COPY

it increases risk, and decreases age of onset

Risk and Age at Onset of AD Depends on APOE allele

Risk of AD by age 75



Number of copies of APOE-4

AAO= average age at onset

Why Study Genetics of Alzheimer's Disease in Underrepresented Groups?

- Alzheimer's disease is a health disparity
- Genetics of AD and Hispanics in African Americans is unclear and underrepresented in literature
- First degree relatives are more likely to get AD
- *apoE* genotype is elusive in African Americans and Hispanics
- Until recent years no URMs were included in large genetic studies of AD!

PREVALANCE OF AD

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Neighborhood Disadvantage is a Social Determinant of Health

- Alzheimer's disease and other chronic diseases disproportionately impact racial/ethnic minorities and the socioeconomically disadvantaged populations – populations often exposed to neighborhood disadvantage

  Link and Phelan. *J. Health Soc Behav*, 1995.

- Neighborhood disadvantage influences many factors including health behaviors, access to food, toxic exposures and personal safety

- Living in a disadvantaged US neighborhood is strongly linked to increased mortality and disease

  Kind et al, *Annals of Int Med*, 2014

Alzheimer's Disease *and Care* -- A Health Disparity

2 out of 3 are

1.5x

Hispanics

2x

African Americans

We Are Living Longer!

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Alzheimer's Disease in African Americans (AA)

- African Americans (AA) are more likely to develop AD and dementia compared to non-Hispanic white (NHW) populations
  - Greater familial risk for AD
  - Limited health care access
  - AD patients identified at later stages
  - Poorer treatment outcomes

  - Genetic distinctions
    - Minority populations are underrepresented in genetic studies
    - Ethnic-specific alterations and effect sizes
      - *APOE ϵ4*
        - More frequent in AA
        - Relative risk is lower
      - *ABCA7*
        - Relative risk is greater in AA
        - Different genetic variant

http://www.socialgradient.org/alzheimers-center-aids-african-americans/

http://www.poststat.net/pwp008/pub.49/issue.350/article.528/

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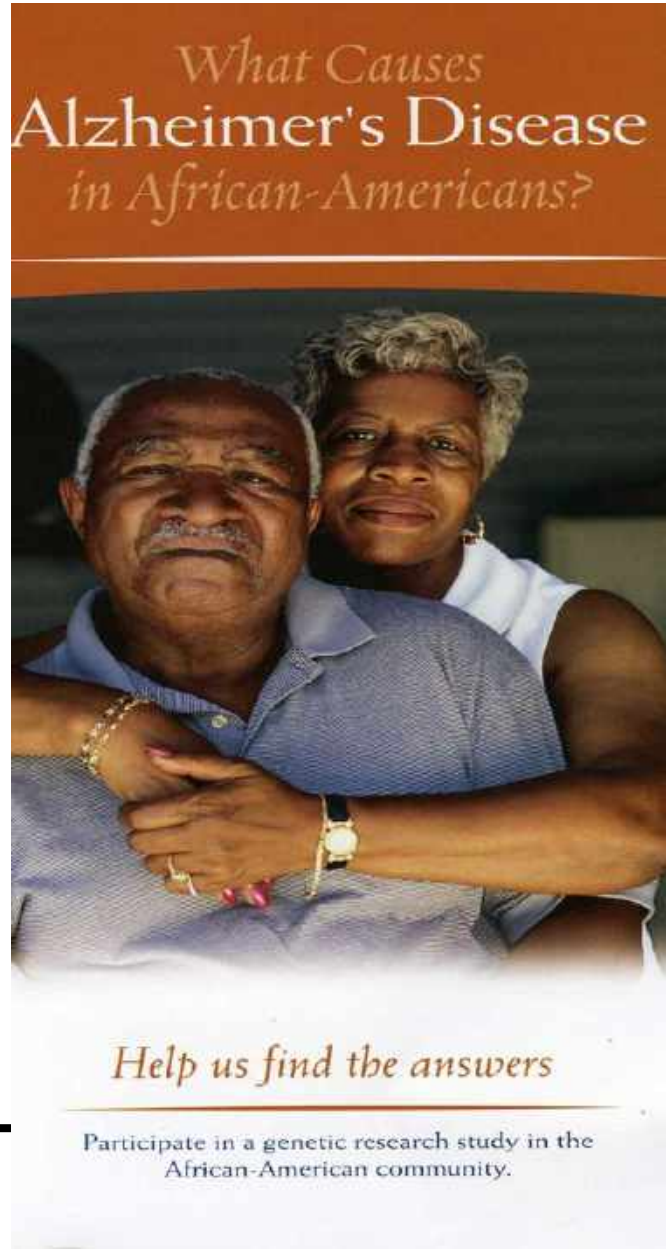
Intentionality: Seeking African Americans

Wake Forest University-(MACHE)

The University of Miami

Columbia University

Case Western Reserve University



PREVENTION

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Reduce Risk of AD

Reduce Risk of AD

- Combining five controllable lifestyle habits such eating healthier, exercising regularly, and refraining from smoking reduced risked of AD by 60%.

- Researchers found that people who reported healthier lifestyles overall—those who stuck to a low-fat diet, did not smoke, exercised at least 150 minutes each week at moderate-to- vigorous levels, drank moderately and engaged in some late-life cognitive activities—had lower levels of Alzheimer's dementia.

- Those following two or three of the healthy lifestyle factors reduced their risk of developing Alzheimer's dementia by 39%.

AD SUPPORT

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Center for Outreach in Alzheimer's, Aging and Community Health
At
North Carolina A&T State University

Maya Angelou Center for Health Equity
At

COAACH AND MACHE: MODELS OF COLLABORATIVE RESEARCH, TRAINING AND COMMUNITY ENGAGEMENT

Existing MACHE Programs in Key Areas

Educational Initiatives

- **Pipeline programs**
  - American Indian Biomedical Summer Academy (AIMS), Medical Careers and Technology (MedCaT)
- **Career development and cross-disciplinary trainings**
- **Research Ambassadors**

Community Partnerships

- **NC American Indian Health Board** (funded by KBR)
- **Native Pathways to Health** (funded by KBR, NC Office of Minority Health & Health Disparities, BCBS)
- **Carolina Geriatric Workforce Enhancement Project** for memory loss (funded by UNC-CH)
- **Community Engagement:** All of Us, Cultural Heritage Celebrations
- **Integrating Special Populations**
  - Research navigation, Translation services, Consultations, Study Coordinator Research Forum (SCaRF)

Translational Research

- **Dr. Irby**
  - Native Pathways to Health
  - Understanding community engagement within learning healthcare systems
  - Behavioral self-management of chronic pain among special populations
- **Dr. Byrd**
  - Alzheimer's disease and genetics in African American and Puerto Rican populations (funded by NIH)
  - Brain Health and Prevention Registry (funded by the State of NC)

MACHE Activities

2018

Attended and/or hosted **~40** events

Connections made with **~2,500** individuals

- UNC Minority Health Conference
- NC American Indian Unity Conference
- Building Integrated Communities Symposium
- Juneteenth Festival
- Winston-Salem Hispanic League Fiesta
- Southeast American Indian Studies Conference
- State of Black NC Conference
- Hispanic Heritage month (Sept) event
- American Indian Heritage month (Nov) event
- Triad Gentrification Symposium
- Planning for Healthy Communities Conference
- Domestic Violence month Silent Witness Exhibit
- “All of Us” Community Event

Alzheimer's Disease Research Center

Community Connections

Support Groups

Annual Caregiver Education Conference

Lunch and Learns

Educational Awareness Galas

Town Hall Meetings

Volunteer Program

Celebrity Luncheon

Purple Saturday

Faith-Based Tool-Kit and Events

Monthly Electronic Newsletter

Family Navigation Program

Caregivers' College

How we Can Help

- Become an Advocate
- Provide respite for a loved one or friend
- Join A Research study
  - www.wakehealth.edu/mache
- Increase Awareness
- Volunteer

Words of Dr. Angelou

"I believe the responsibility for tomorrow
is in our hands today!
.

Thank You

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