

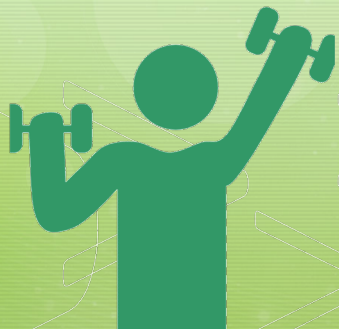
Building Resiliency to Cognitive Decline in Aging and Dementia

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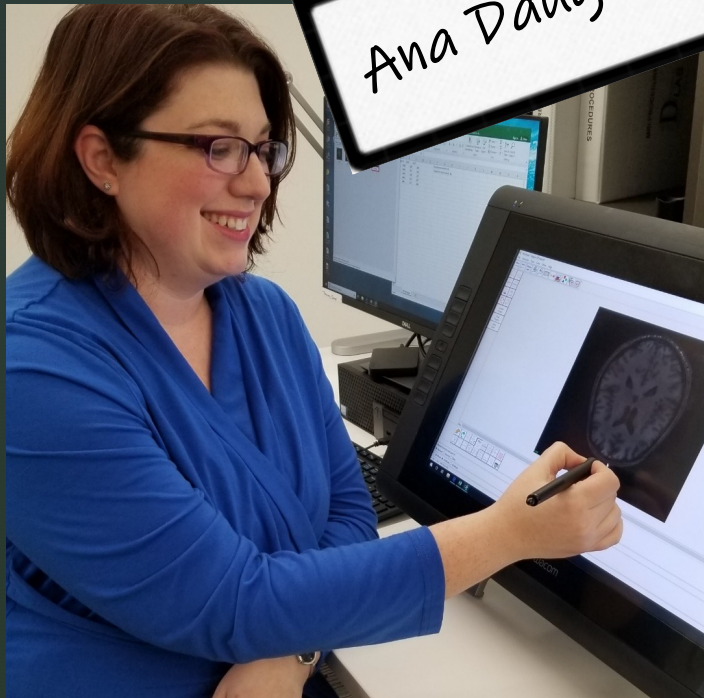
Birmingham Men's Club





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Institute of Gerontology & Department of Psychology
Wayne State University

Over 14 years studying brain and cognitive aging


Director, Detroit Aging Brain Study

Website: agingbrain.wayne.edu



Learning Objectives

1. Describe typical brain and cognitive declines in aging
2. Define “dementia” and its causes in disease
3. Review lifestyle and health factors that promote cognitive maintenance
4. Identify everyday things that can build resiliency against developing dementia



1. Typical Brain and Cognitive Decline in Aging

- Overall Brain Shrinkage
- Enlarged Ventricles
- Demyelination
- Localized volumetric shrinkage
- Cortical Thinning



Old

Young

Kennedy & Raz, 2015

MRI Brain Volumes



Y

O

Hippocampal Volume

- “Memory” structure
- Shrinks in Aging
- Greater decline in dementia

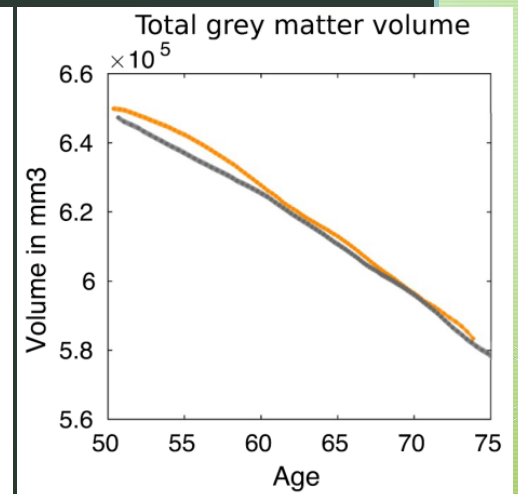
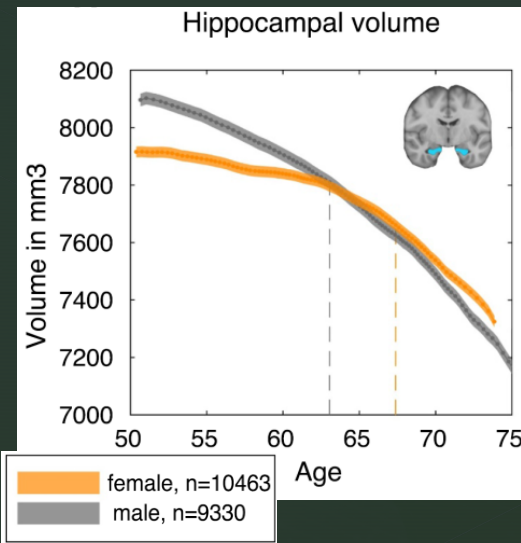
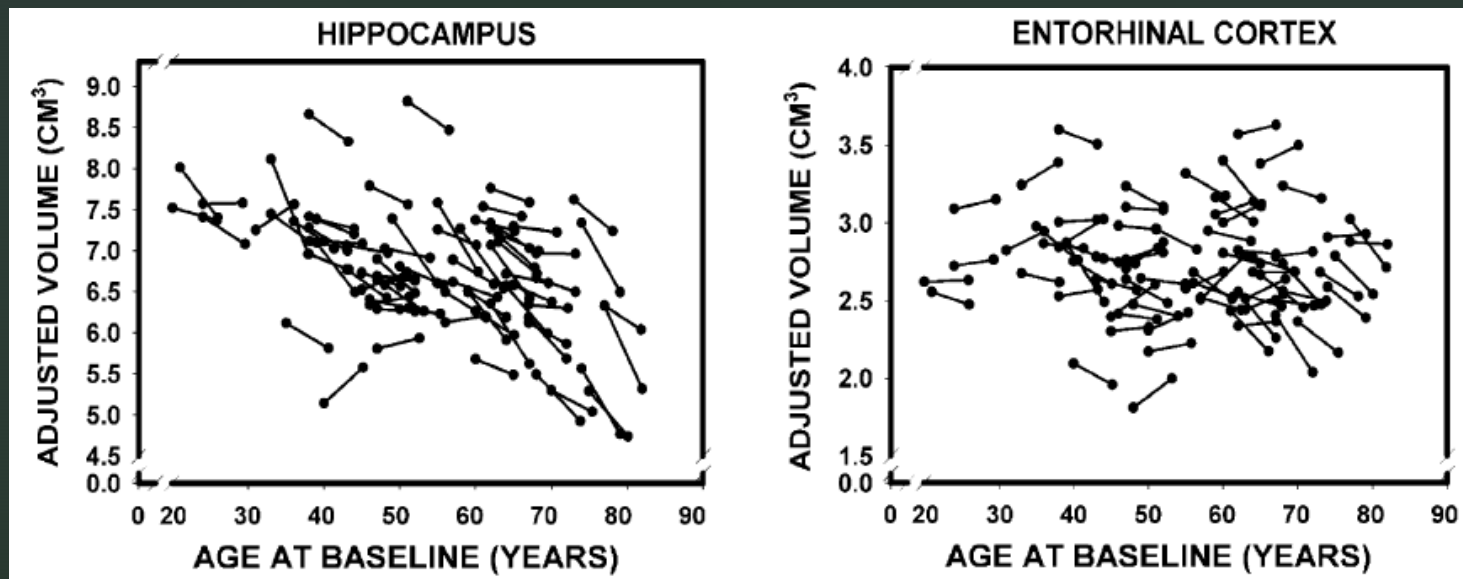


Image: brainmaps.org
Wolk et al., 2011; Nobis et al. 2019

People Age Differently



Variability in aging is 25% genetic; 75% is determined by lifestyle & environment
(Passarino et al., 2016)

Figures adapted from Raz et al., 2005

Lifespan Cognitive Development

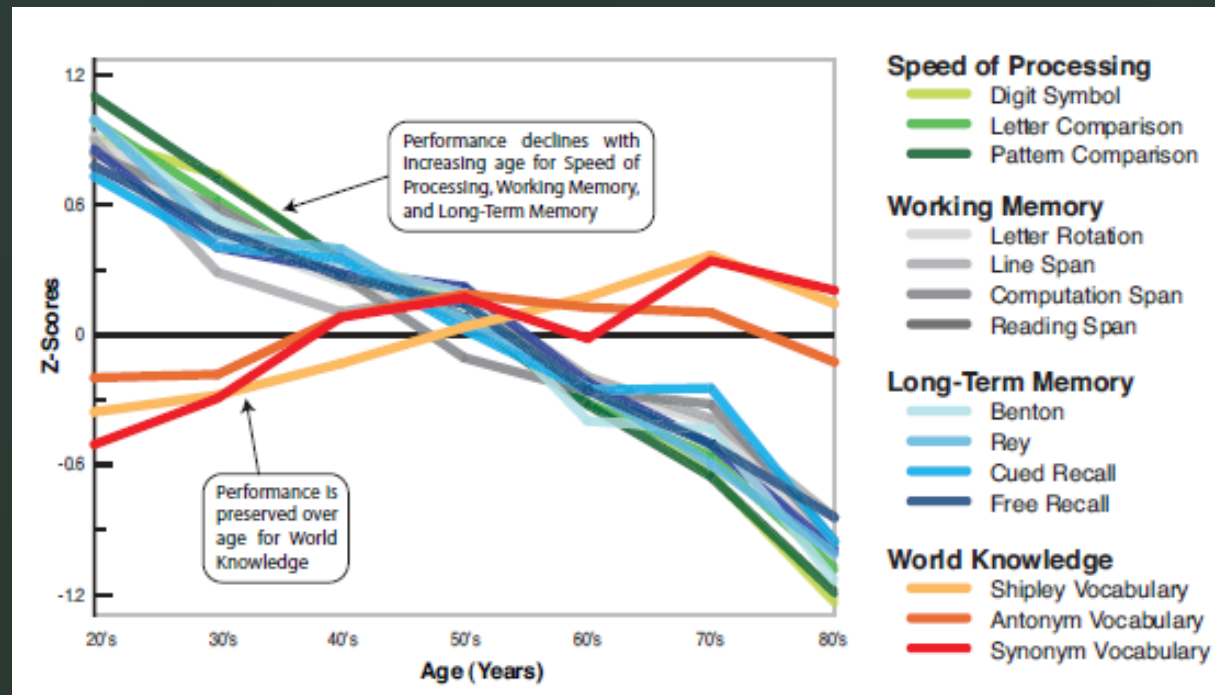
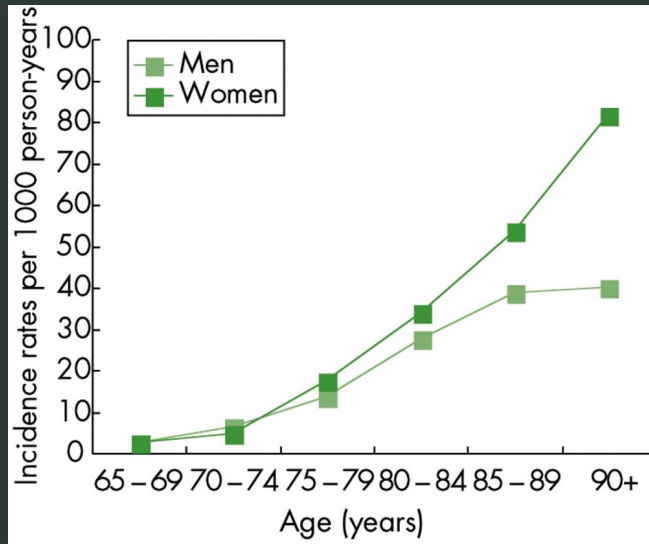


Figure from Park & Reuter-Lorenz, 2009



2. What is dementia?

Different Types of Dementia



van der Flier & Scheltens, 2005

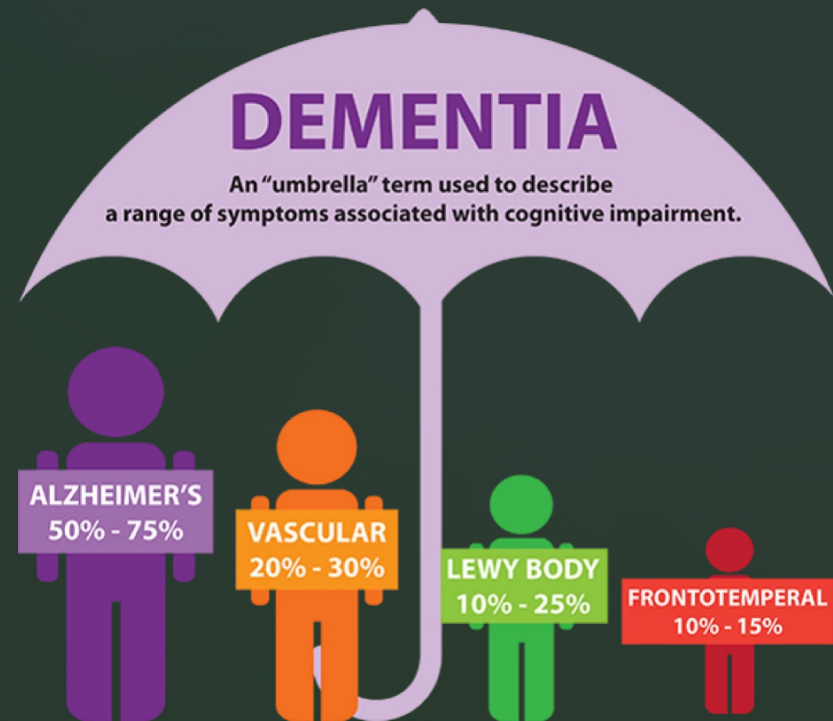


Image: <https://dfwsheridan.org/types-dementia>

Overview of Dementia Stages

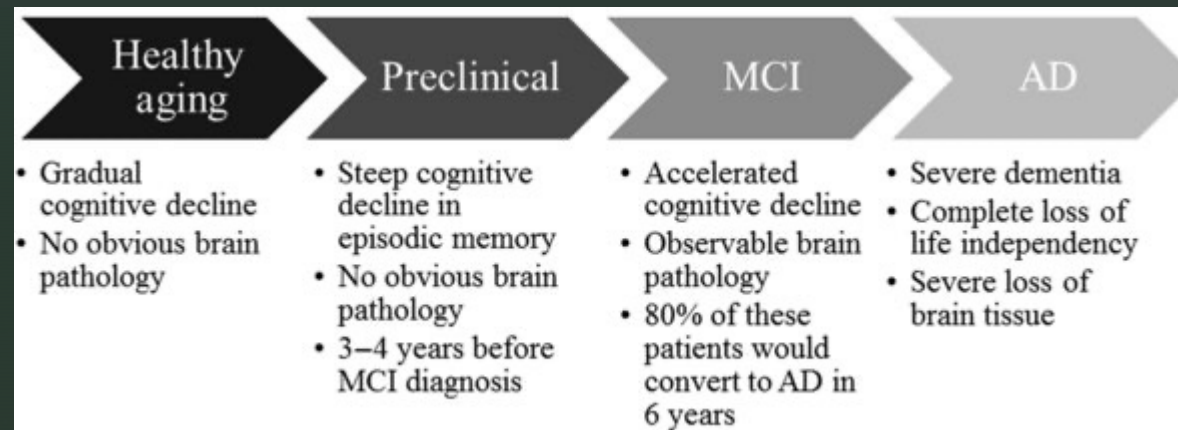


Figure from Basak & Qin, 2018

Possible Biomarkers

A / T / N: Amyloid / Tau / Neurodegeneration

- CSF/PET β -Amyloid
- CSF tau or p-tau
- MRI Hippocampal Volume

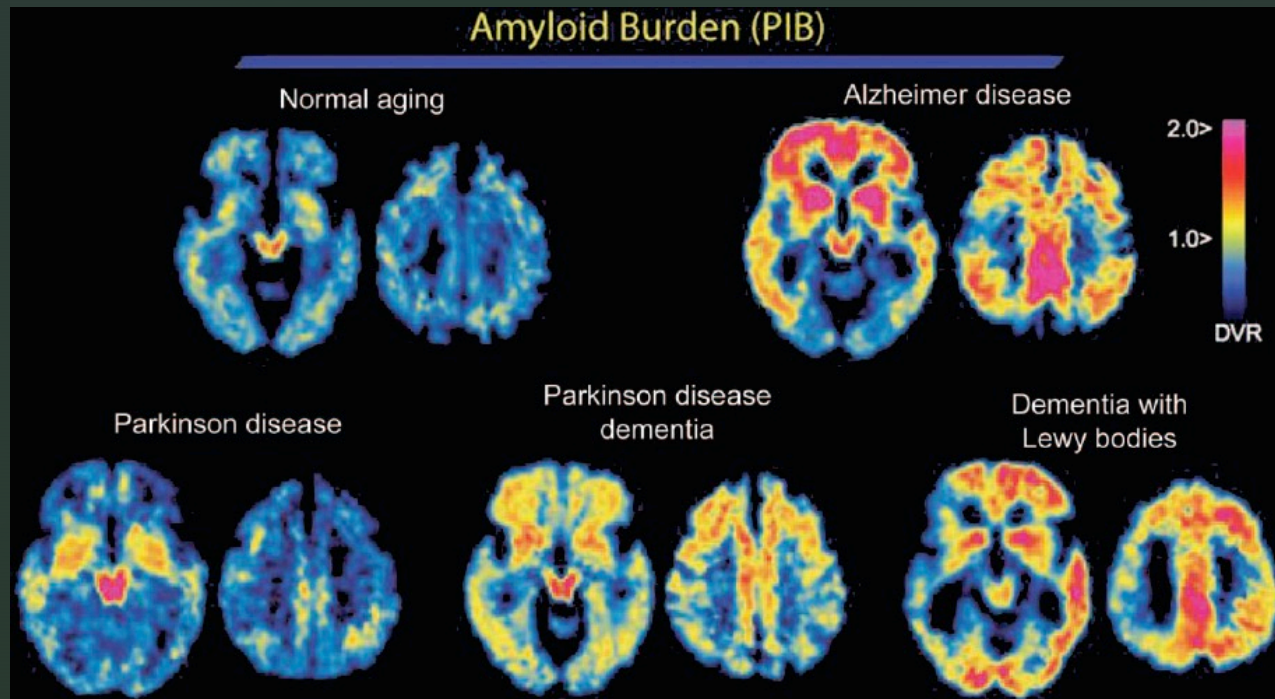
Dementia:

Clinical Function Deficit

Impaired
Activities of Daily Living

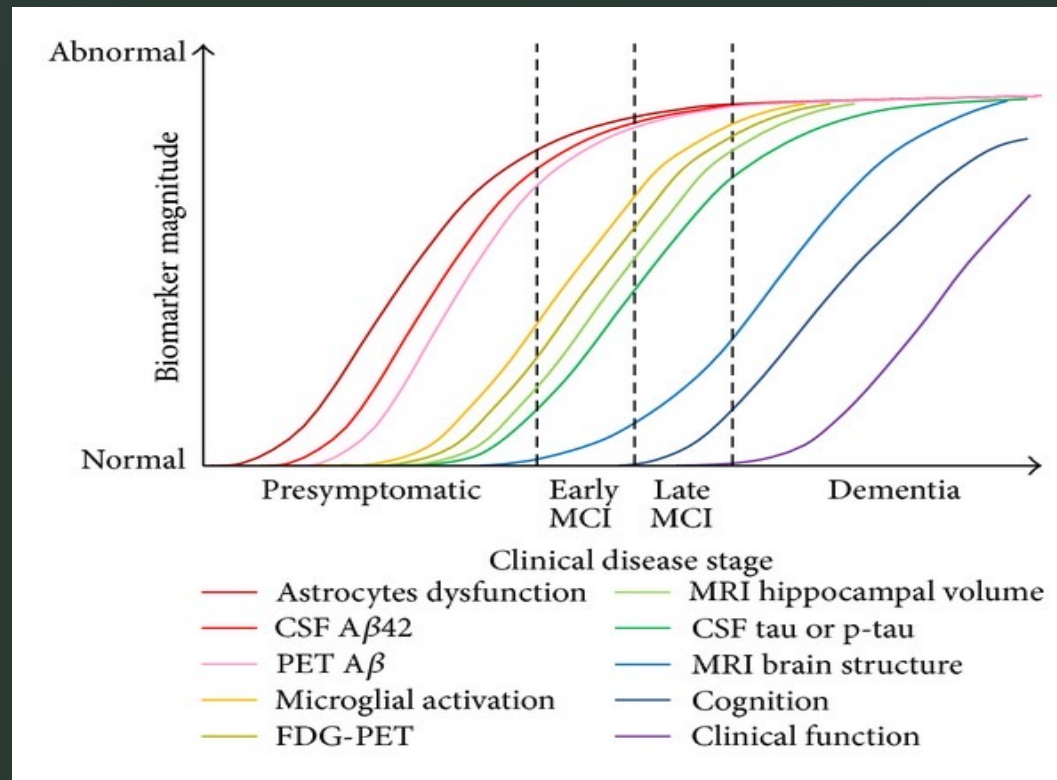
Leclerc & Abulrob, 2013

β -Amyloid Deposition



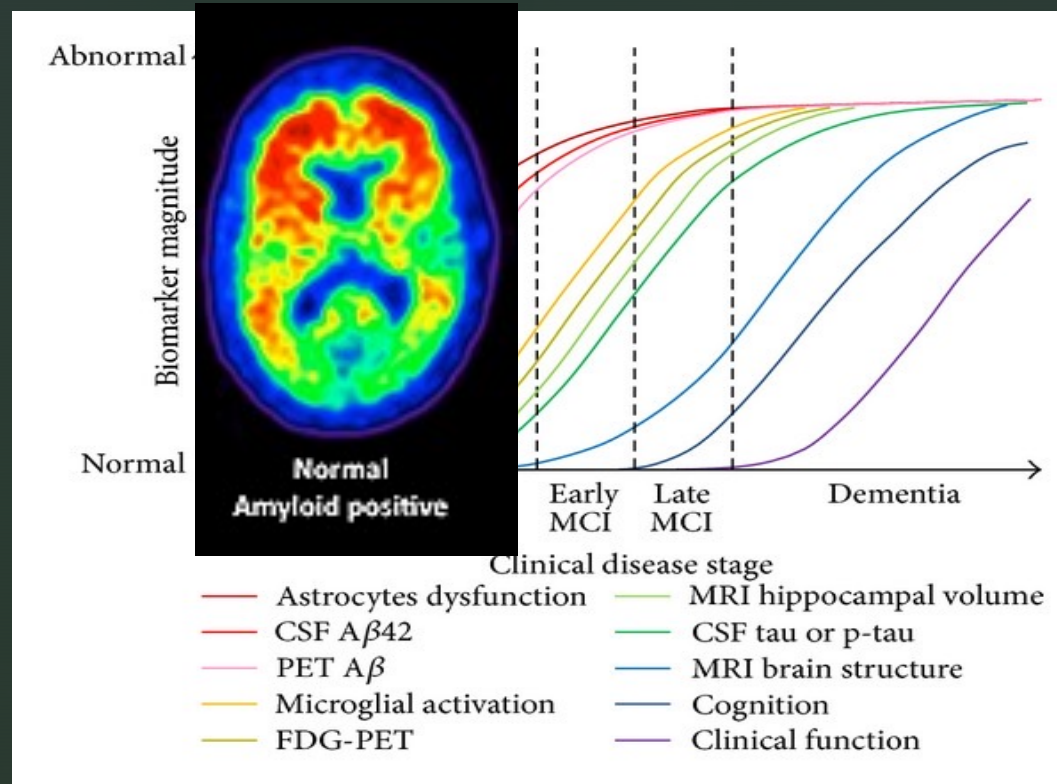
Gomperts et al., 2008

Biomarker Sensitivity Across Stages



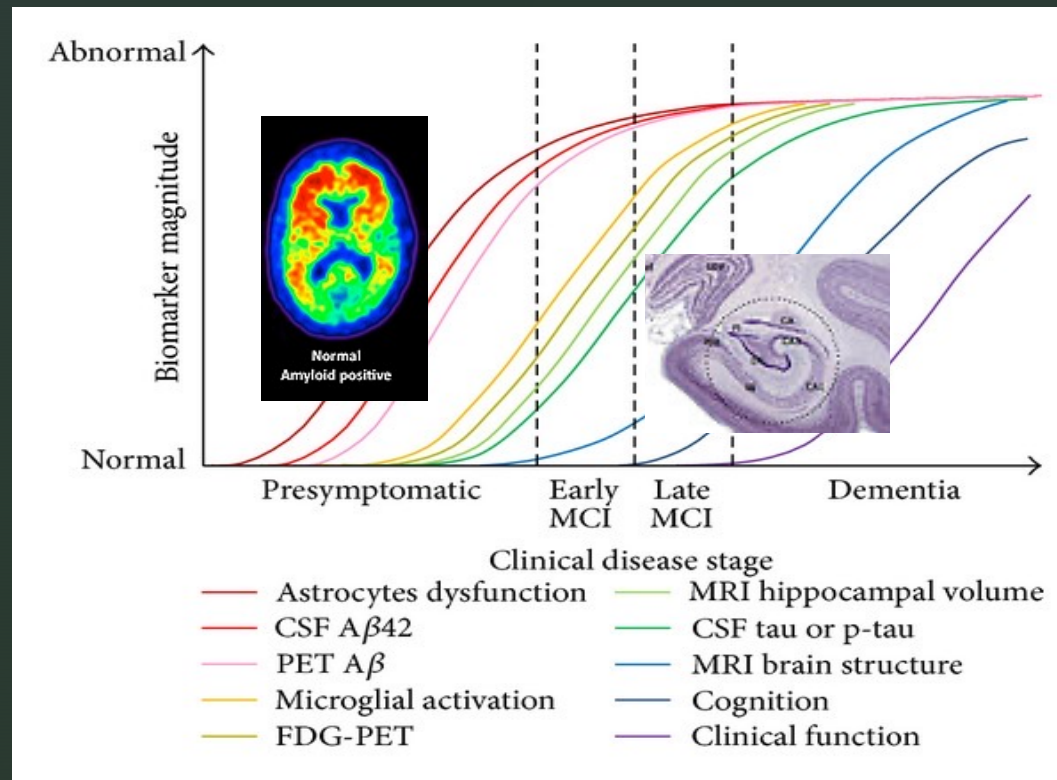
Jack et al., 2013; Figure: Leclerc & Abulrob, 2013

Biomarker Sensitivity Across Stages



Jack et al., 2013; Figure: Leclerc & Abulrob, 2013

Biomarker Sensitivity Across Stages



Jack et al., 2013; Figure: Leclerc & Abulrob, 2013



3. Lifestyle and Health Factors for Cognitive Maintenance

▲ Risk for Cognitive Decline: Health Profile

Risk Factors

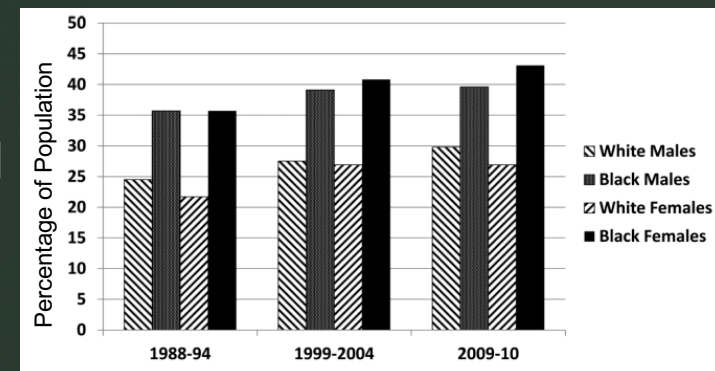
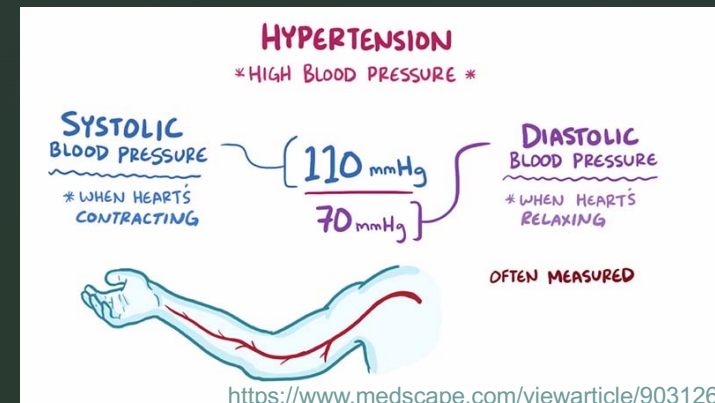
- Age
- Genetic/Family History
- Smoking/Alcohol Misuse
- Poor Cardiovascular Health
- General Frailty
- Depression

Protective Factors

- Education
- Frequent Aerobic Exercise
- Healthy BMI
- Cognitive Engagement
- Socialization
- Active Lifestyle

- Definition: BP 130 / 80
 - Prevalence: 1 in 3 Adults
 - 2 x Risk
 - Alzheimer's Disease and Related Dementia

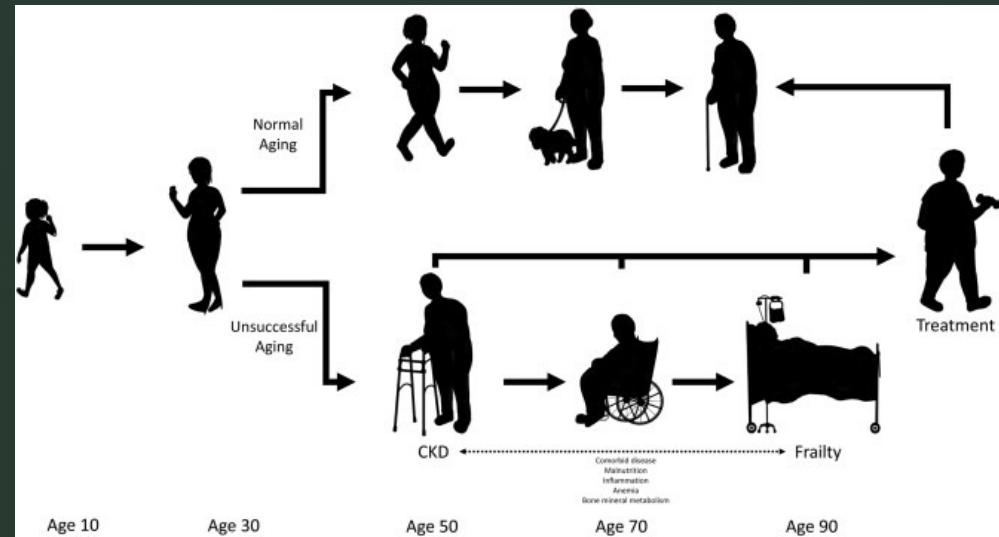
Risk: Hypertension



Lackland, 2014

- Definition:
 - Weight Loss
 - Exhaustion
 - Low Activity
 - Slowness
 - Weakness

Risk : Frailty



- Prevalence: 7-12% age 65+

Aerobic Exercise, Stretching, Strength Training

Moderate-intensity aerobic activity

Anything that gets your heart beating faster counts.

at least
150
minutes
a week

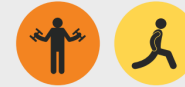


AND

Muscle-strengthening activity

Do activities that make your muscles work harder than usual.

at least
2
days
a week



https://www.cdc.gov/physicalactivity/basics/older_adults/index.htm

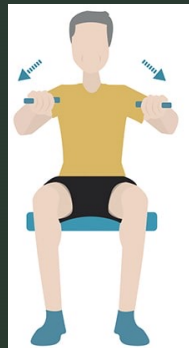


Image:
<https://californiamobility.com/21-chair-exercises-for-seniors-visual-guide/>

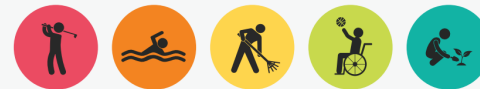
Sitting Less and Daily Steps

- Reducing the amount of time we sit has big health benefits
- Increasing steps per day (walking, low impact) is one way to do this
 - Age < 60: 8,000 – 10,000 steps/day
 - Age > 60: 6,000 – 8,000 steps/day

Moderate-intensity aerobic activity

Anything that gets your heart beating faster counts.

at least
150
minutes
a week



7,000 – 9,000 steps/day → 150 min/week



Daily Nutrition

- 5–12 servings of grains
- 5–10 servings of fruits and vegetables
- 2–4 servings of milk products
- 2–3 servings of meat or meat alternative
- High fiber, complex carbohydrates
- < 30% calories from fat
- Nutrient dense foods
- 1200 mg/d calcium (age > 50)
- 400 IU Vit D (50-70), 600 IU (> 70)

Health Experience Journaling

- Did you take meds on time?
- Did you drink water throughout the day?
- How did you sleep?
- What did you do today?
- How did you feel?





4. Building Resiliency against Developing Dementia

What is Resiliency?

- Risk is a set of factors (typically health factors) that act together to worsen cognitive decline and increase likelihood for dementia
- Protection is often the absence of risk, or lifestyle factors that will reduce health risk
- Resiliency is a set of factors that allow tolerating more risk without showing decline; adapting and bouncing back from risk



Resiliency: Cognitive Engagement

- Definition:
 - Requires Attention
 - Active
 - Stimulating
- Types:
 - Hobbies
 - Learning new skills, information
 - Reading
 - Active Listening



Resiliency: Socialization

- Definition:
 - Other people
 - Interactive
 - Meaningful connection

- Types:
 - Family gatherings
 - Friends
 - Civic & Religious Organizations
 - One-on-One or Group Settings



Resiliency: Mindfulness, Meditation

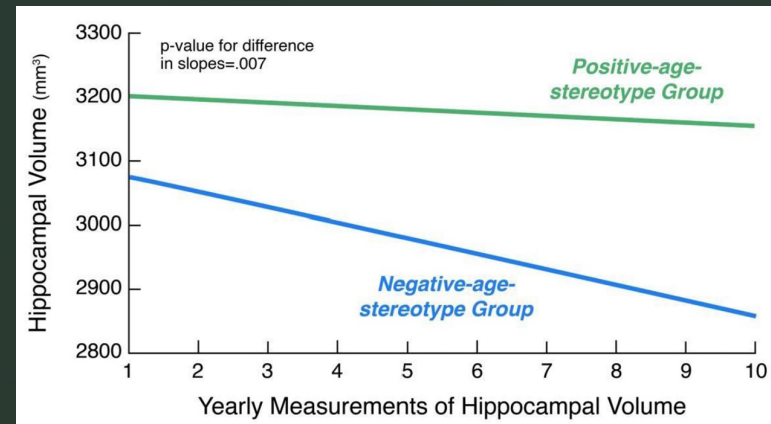
- Definition:
 - Internally reflective
 - Mental state of being conscious or aware
 - Thinking deeply or focused for a period of time

- Types:
 - Self-reflection
 - Guided or Oriented meditation
 - Prayer



Resiliency: Positive Attitude toward Aging

- Definition:
 - Maintain a sense of purpose in life
 - Reject negative stereotypes



Levy et al., 2017

Nakamura et al., 2022

4. Building Resiliency

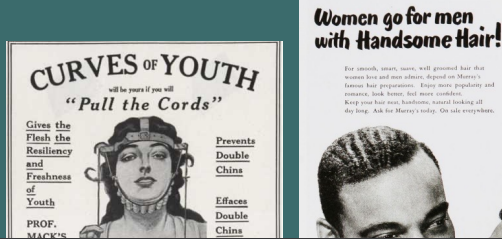
"To be old is to be born again. It is another life, motivated more by love than hate, more by self-effacement than by ambition..." EG Taylor, Reader Magazine, 1906

Old age is our cultural memory of the past

Geriatrics as the opposite of pediatrics

Old age is not a chronological category, it's a state-of-mind: "think young"

"Doctors who lengthen life can be made for a society" Nation, 1940

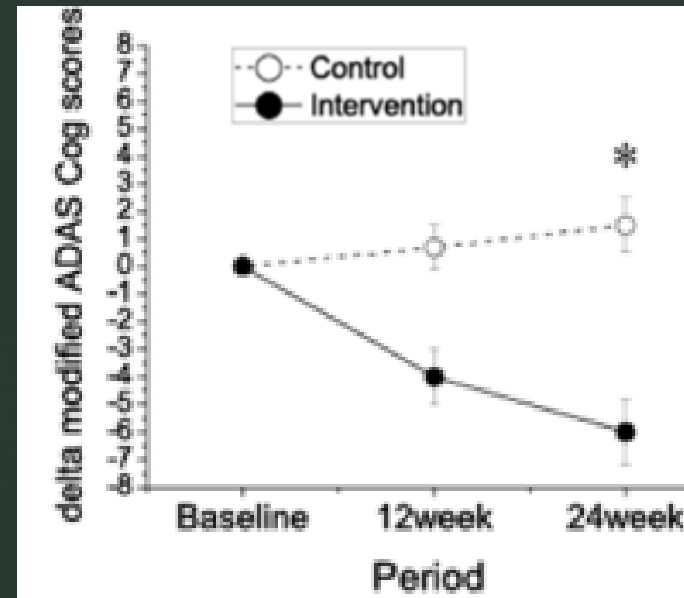


2023

Hirshbien, 2001 J. Am Geriatr

Switching Things Up and Combining

- No evidence for any single hobby/lifestyle behavior to have a greater effect than another
 - Exercise has a consistent benefit
- Switch things up when you get bored
- Some evidence for additive or synergistic effects by combining across categories



Sample = 49 MCI; Randomized to control or aerobic, cognitive dual-task (Park et al., 2019)

Every Day Resiliency Combos

Activity	Exercise	Cognitive	Social	Mindfulness	Positivity
Cooking Class		★	★		😊
Dance Class	★	★	★		😊
Church Group		★	★	★	😊
Gardening	★			★	😊
Movie Watch Party		★	★		😊
Travel	★	★	★		😊
Journaling, Knitting, Crafting		★		★	😊
Shopping	★	★			😊

Daily Plan for Resiliency

Cognitive

- Where could you walk a few more steps today?

Exercise

- What's something that brought you joy yesterday?

Mindfulness

Positivity

- What are you looking forward to about today?

Cognitive

Positivity

- Who will you be connecting with today?

Social

Summary

- Cognitive changes across the lifespan are typical in aging and even greater decline is seen in dementia
- Lifestyle interventions may promote cognitive maintenance in aging, or slow transition to dementia
- Risk-Protective health profiles should be considered, including:
 - Cardiovascular health
 - Nutrition
 - Frailty
- Cognitive Engagement, Socialization, Mindfulness, Positive Attitudes offer some resiliency against developing dementia

Online Resources

- Overview of Brain Healthy & Cognitive Aging, Dementia
 - <https://www.olderadultnestegg.com/for-older-adults/brain-health-aging/>
- Community Resources on the Lab Website:
 - <https://agingbrain.wayne.edu/community-resources>

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