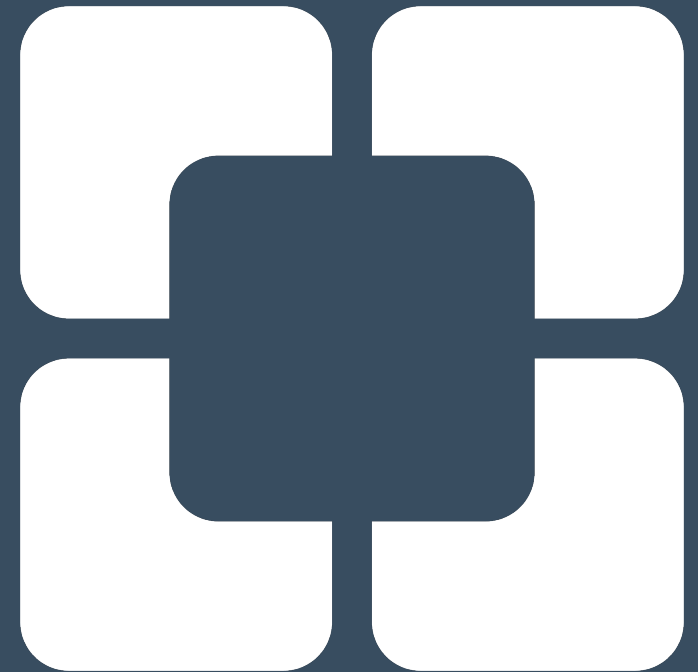


# Sex and Gender in Alzheimer's Disease Risk and Resilience

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**I have no disclosures.**

# Sex and Gender in AD



# GENDER

Socially-constructed roles, behaviours, expressions and identities of girls, women, boys, men and gender diverse people.



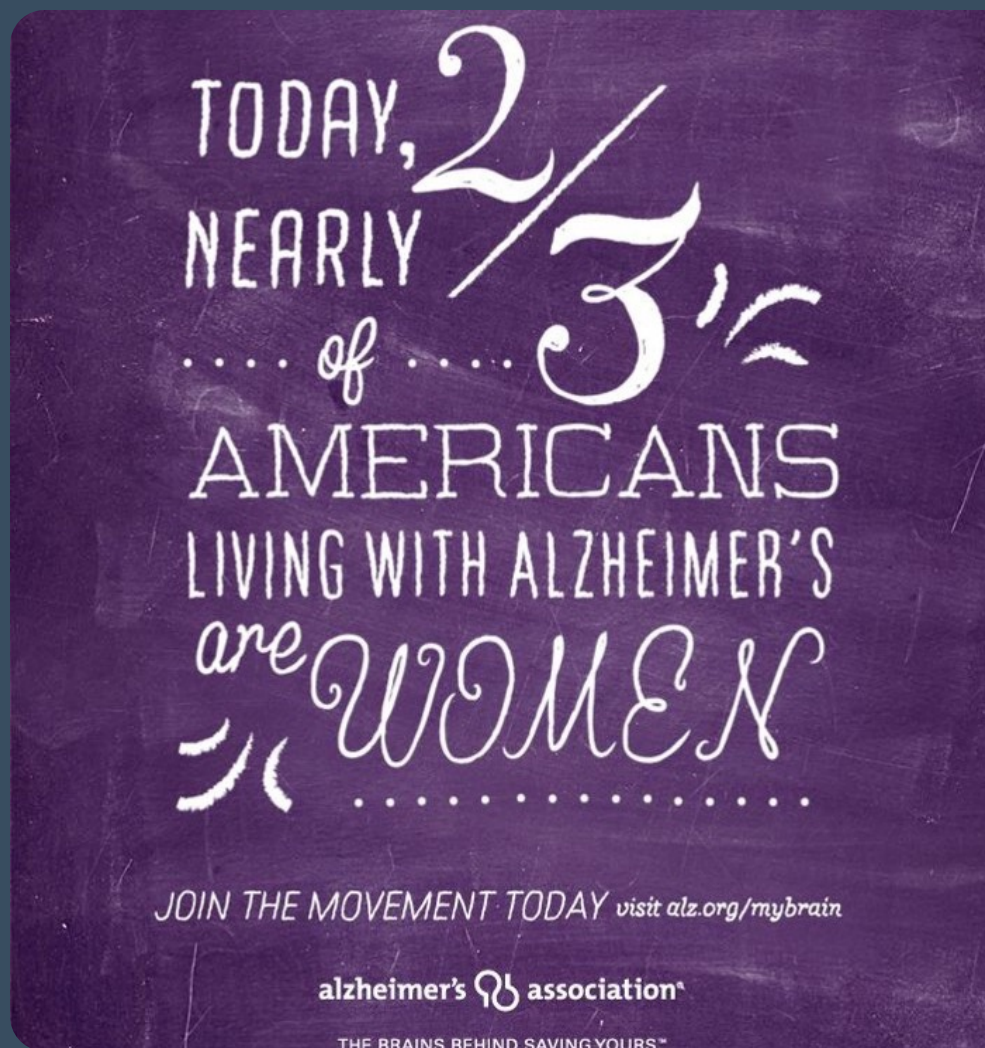
# SEX

Biological attributes of humans and animals, including physical features, chromosomes, gene expression, hormones and anatomy.



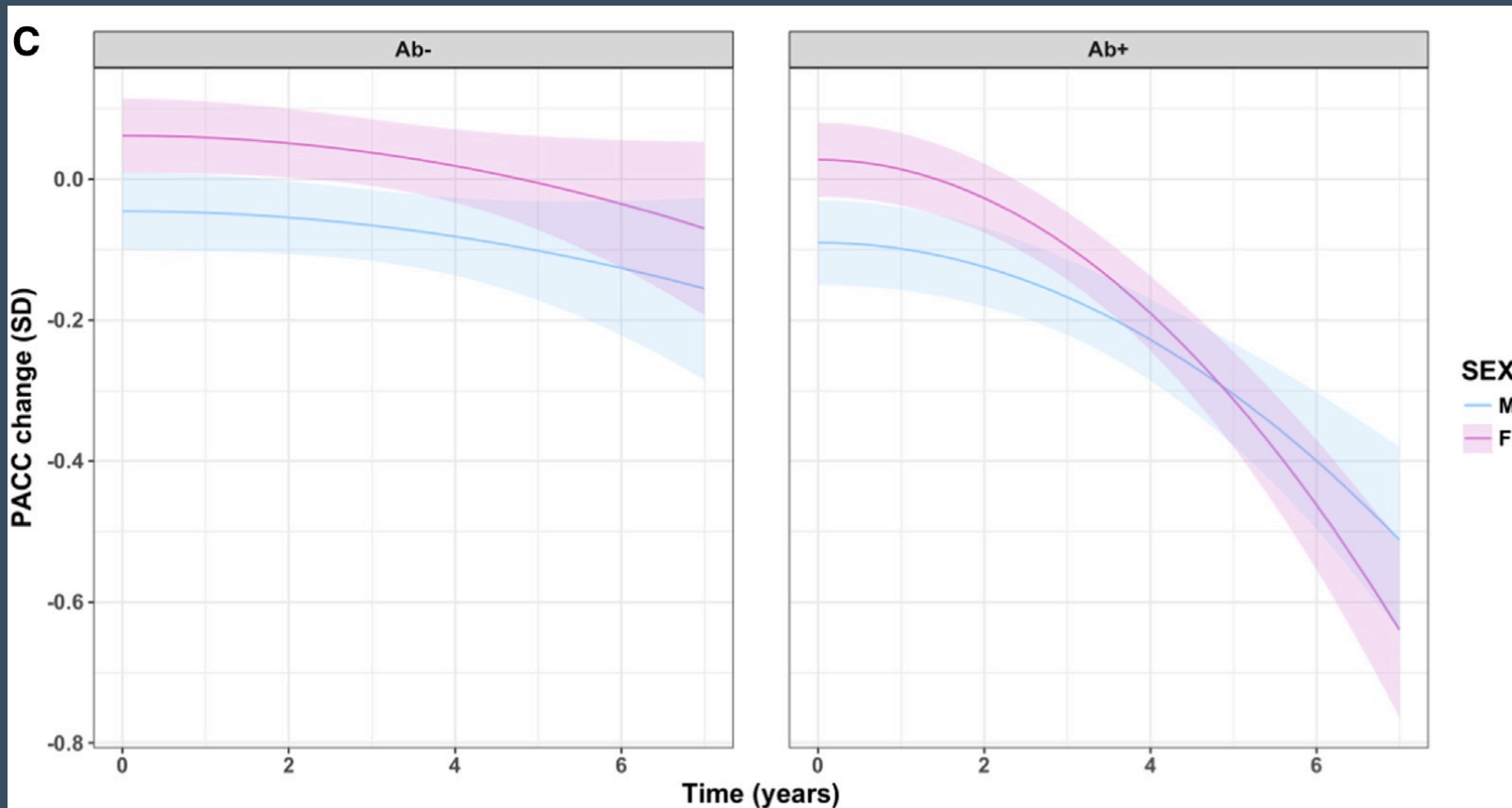


# Alzheimer's Disease and Women

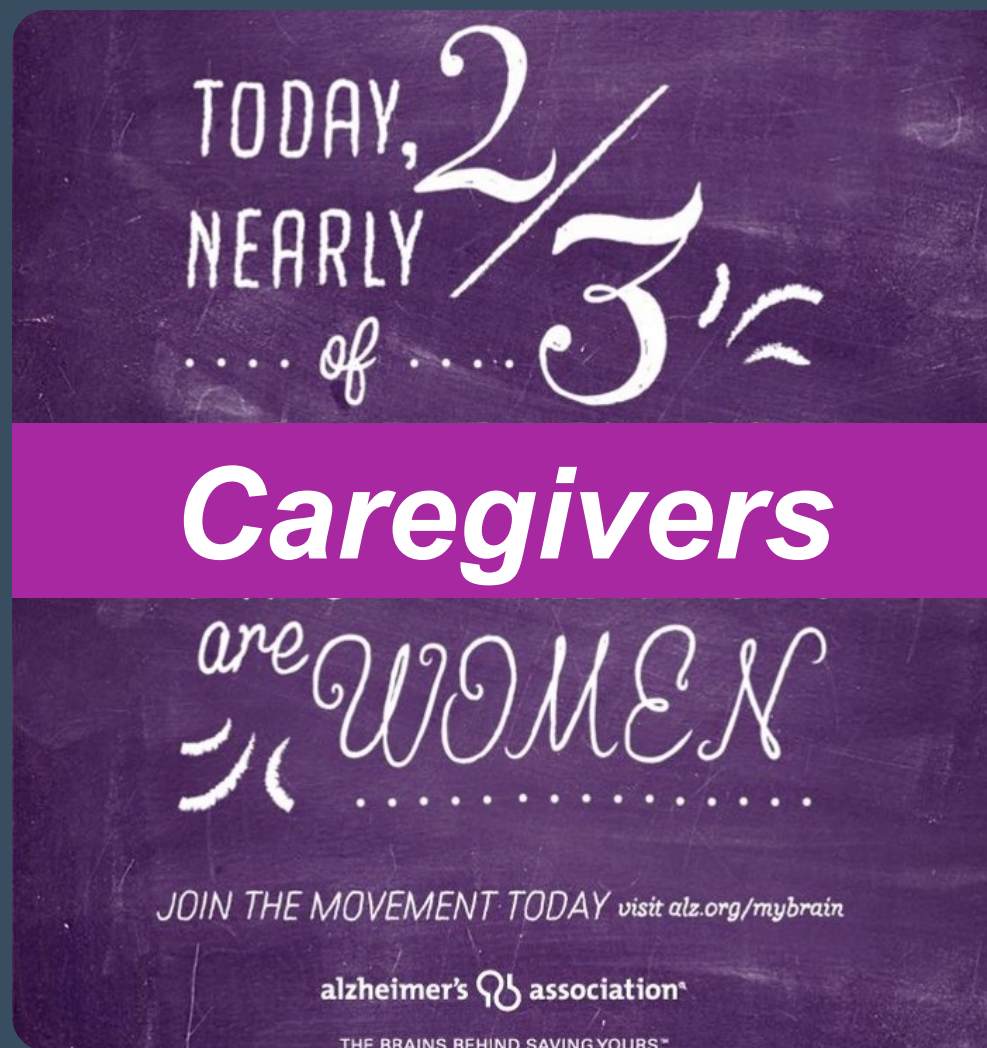


6.5 million people in  
the United States

# Alzheimer's Disease and Women



# Alzheimer's Disease and Women



11 million people in the  
United States



# Sex- and Gender-Based Risks





# Sex, Gender, and AD Risks

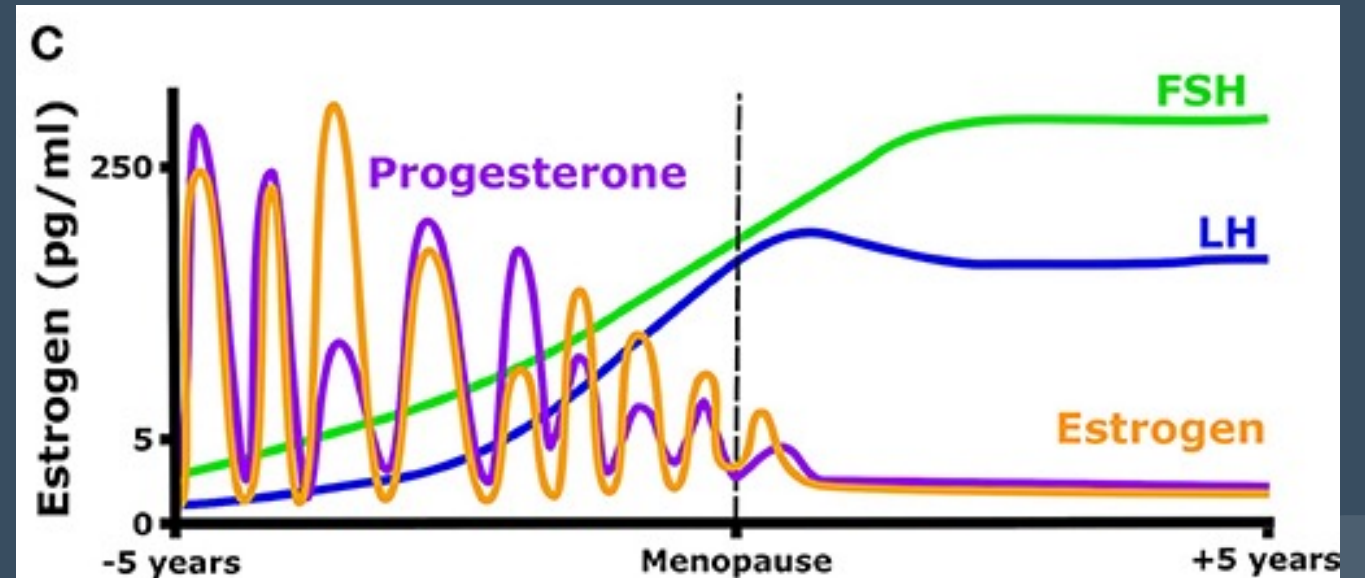


# Menopause

Average age = 53

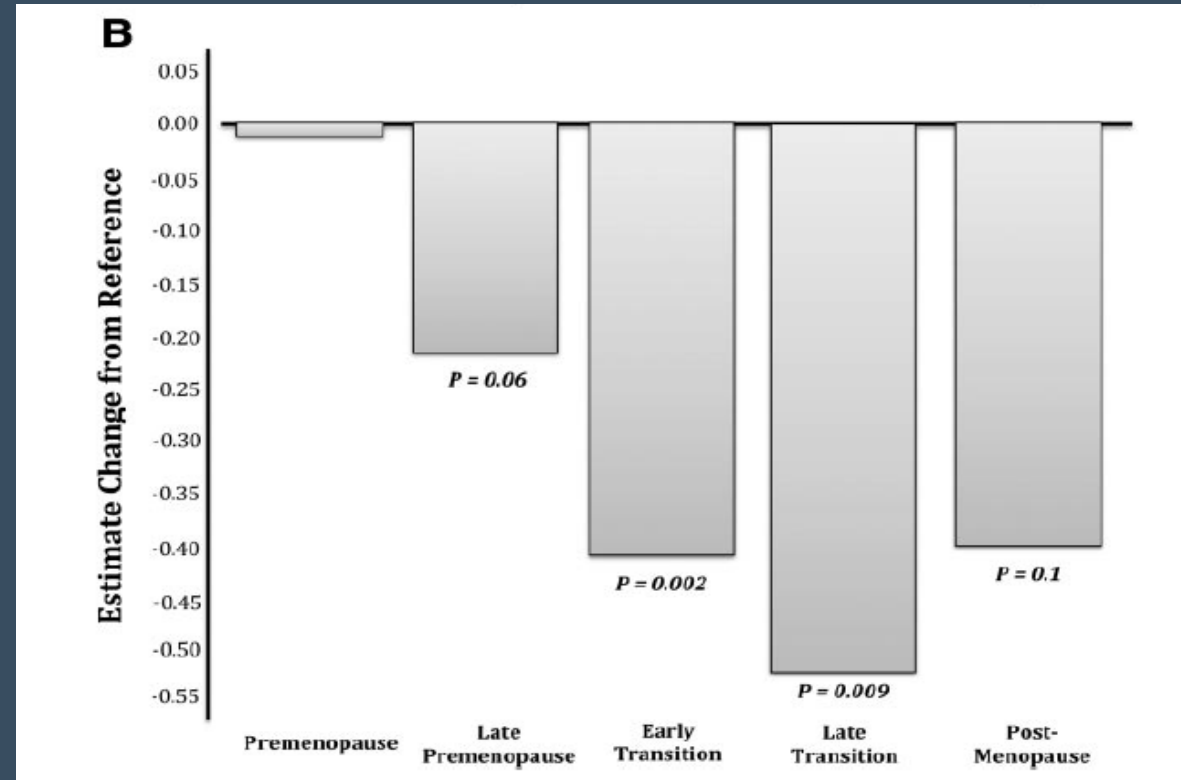
Amyloid accumulation = 1-2  
decades before symptoms

Typical symptom onset = mid-70s



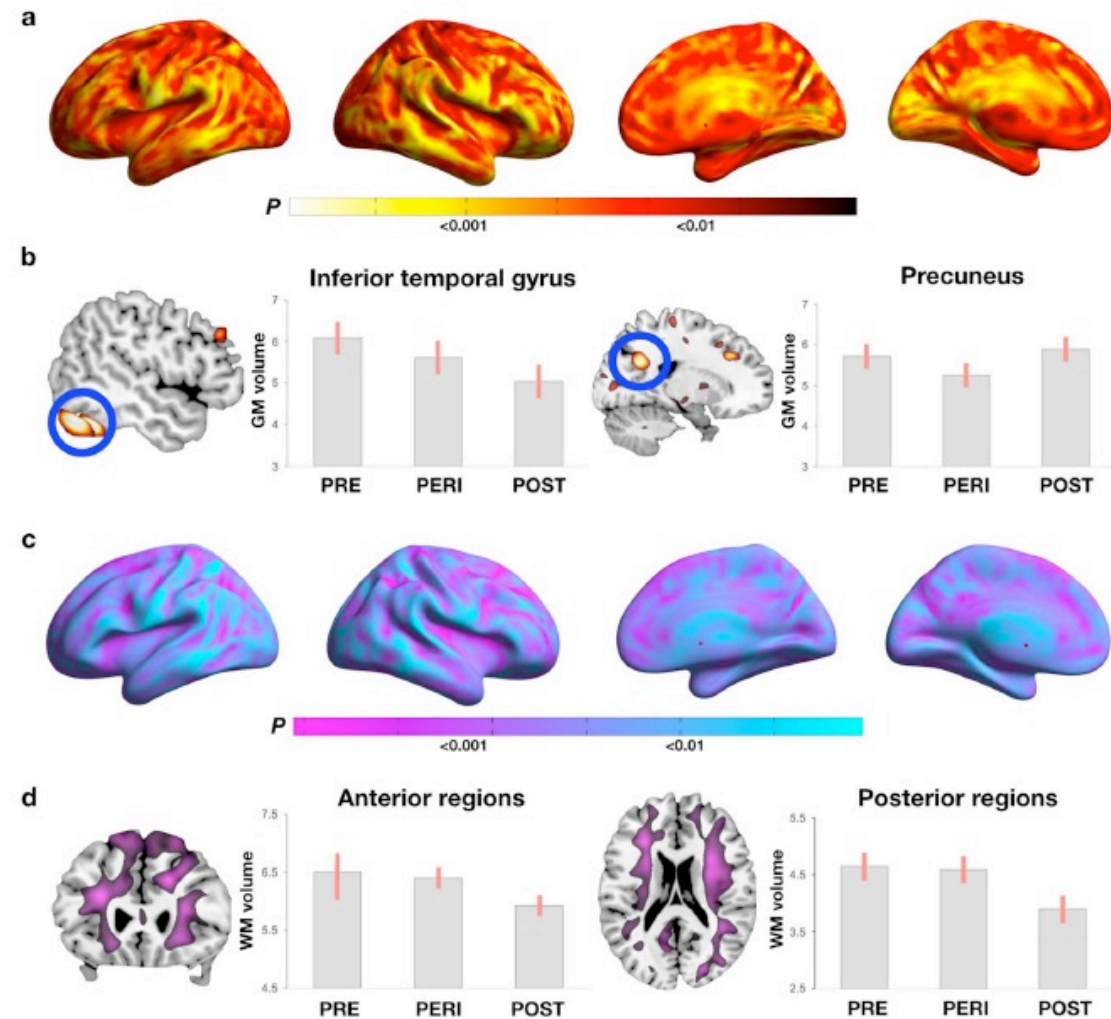
# Menopause and memory

Memory “dip” observed at menopause

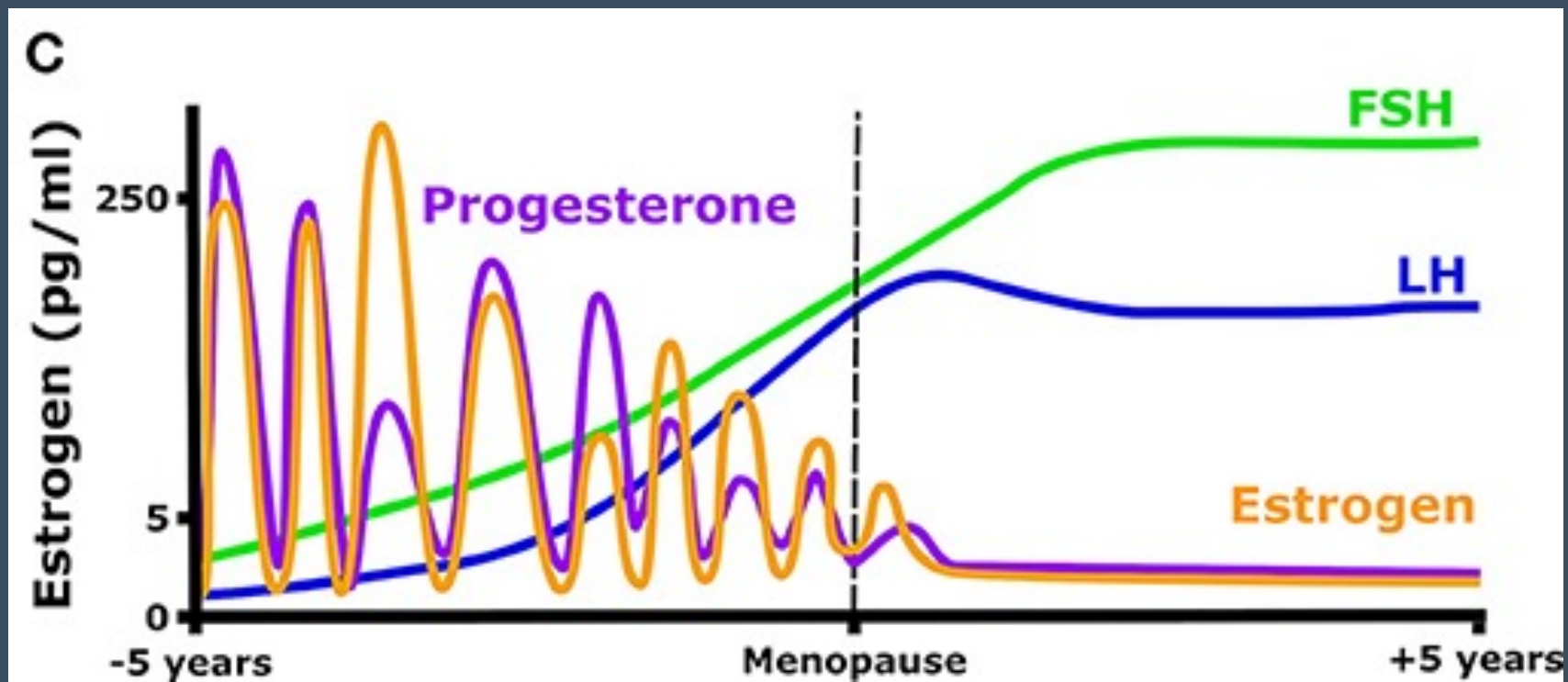




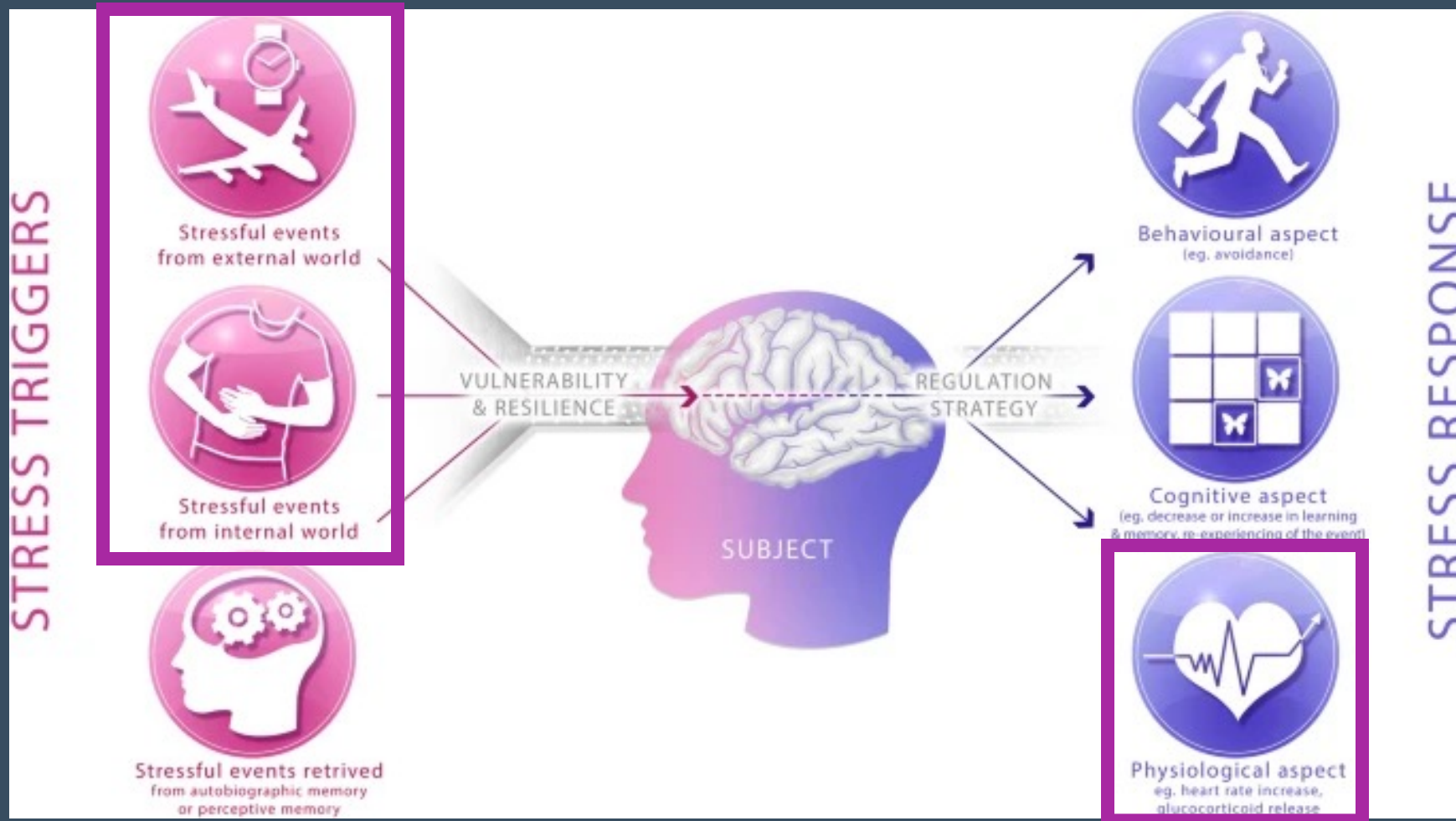
# Menopause and Brain Structure



# Menopause



# Stress

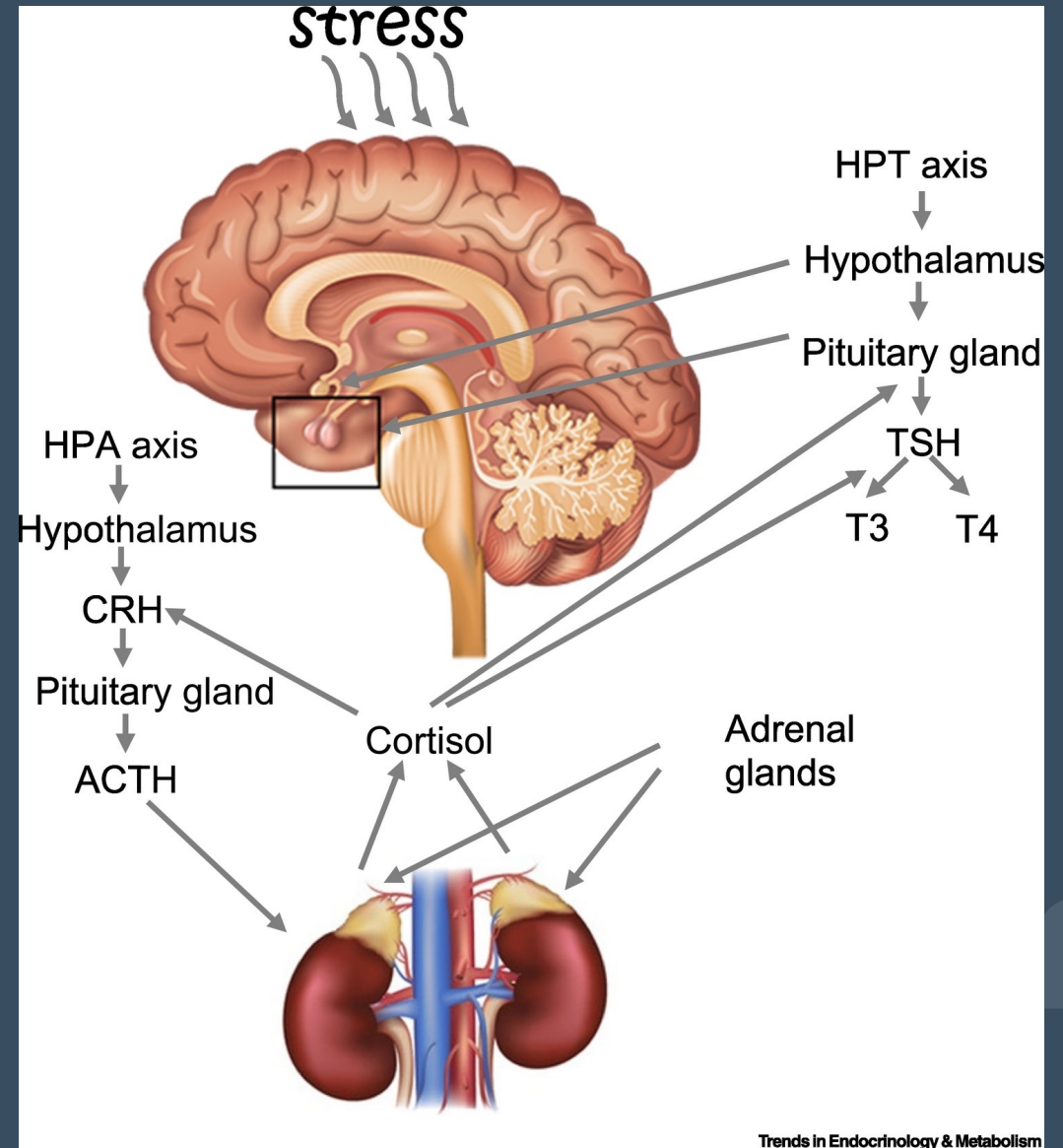




# Cortisol and Alzheimer's

## Cortisol

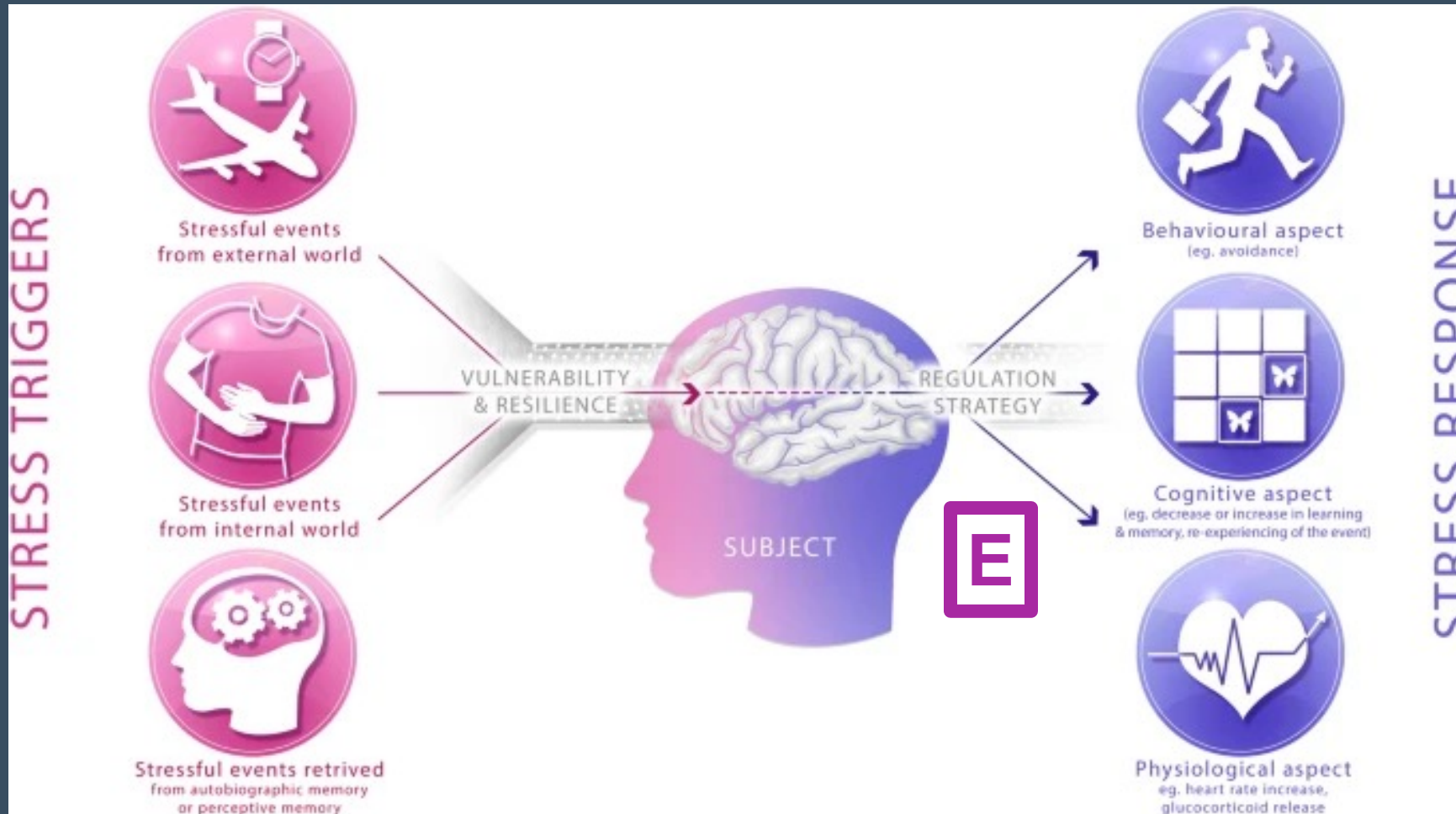
- Immediate and prolonged response differs by sex
- Poor memory
- Reduced plasticity
- Increased cell death in the hippocampus
- Risk for dementia and Alzheimer's disease



# Inflammation and Alzheimer's

- Immune responding differs by sex
- Inflammation facilitates AD pathology

# Stress as AD Risk





# Risk summary

- Many sex- and gender-based factors may play into AD risk for women
- Menopause and stress are two that can be addressed



# Sex, Gender, and Resilience



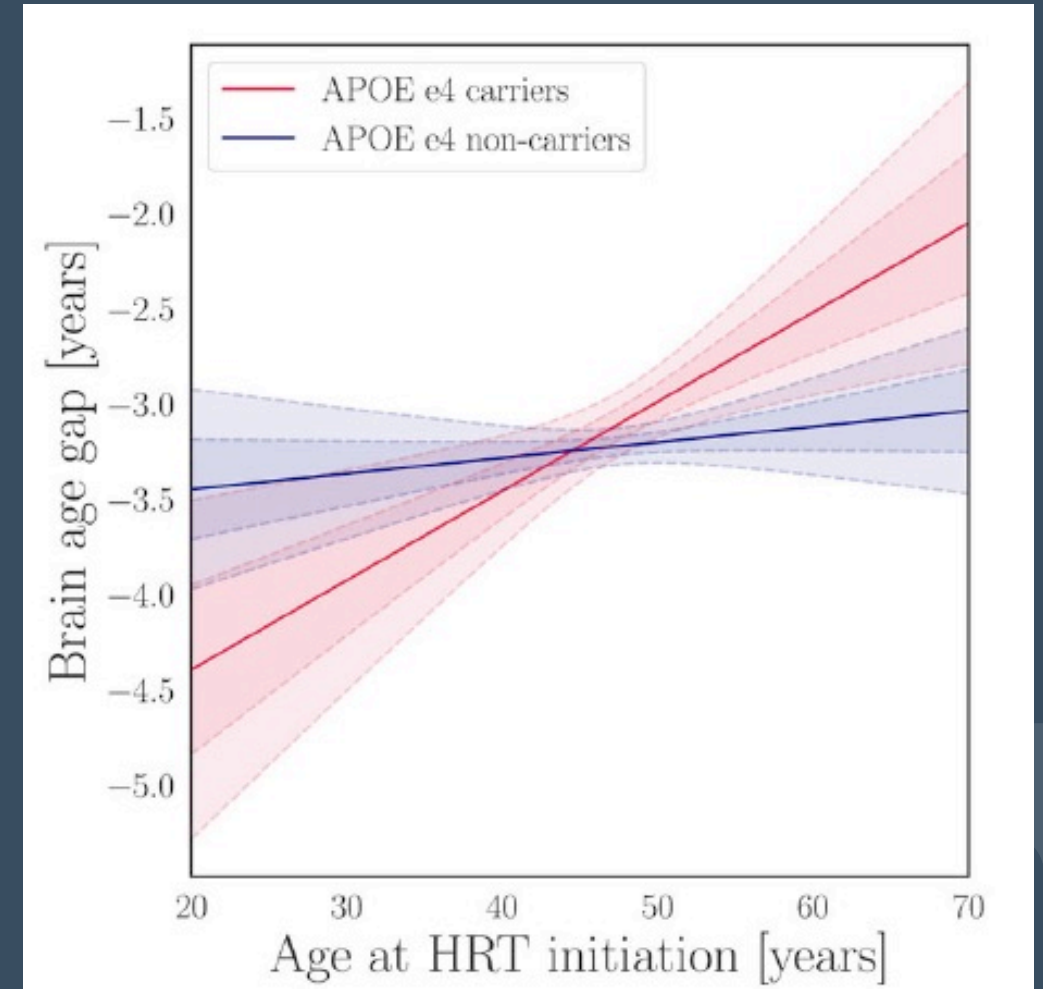
# Alzheimer Prevention

- Hearing loss (8.2%)
- Less education (7.1%)
- Smoking (5.2%)
- Depression (3.9%)
- Social Isolation (3.5%)
- TBI (3.4%)
- Air Pollution (2.3%)
- Hypertension (1.9%)
- Physical inactivity (1.6%)
- Diabetes (1.1%)
- Alcohol (0.8%)
- Obesity (0.7%)



# A Window of Opportunity?

- Early menopause (+)
- Long past menopause (-)
- Around the time of menopause (?)
  - HRT >1yr decreases risk of dementia and AD
  - With/without genetic risk?
- Can we build a better HRT?



# Promoting Resilience

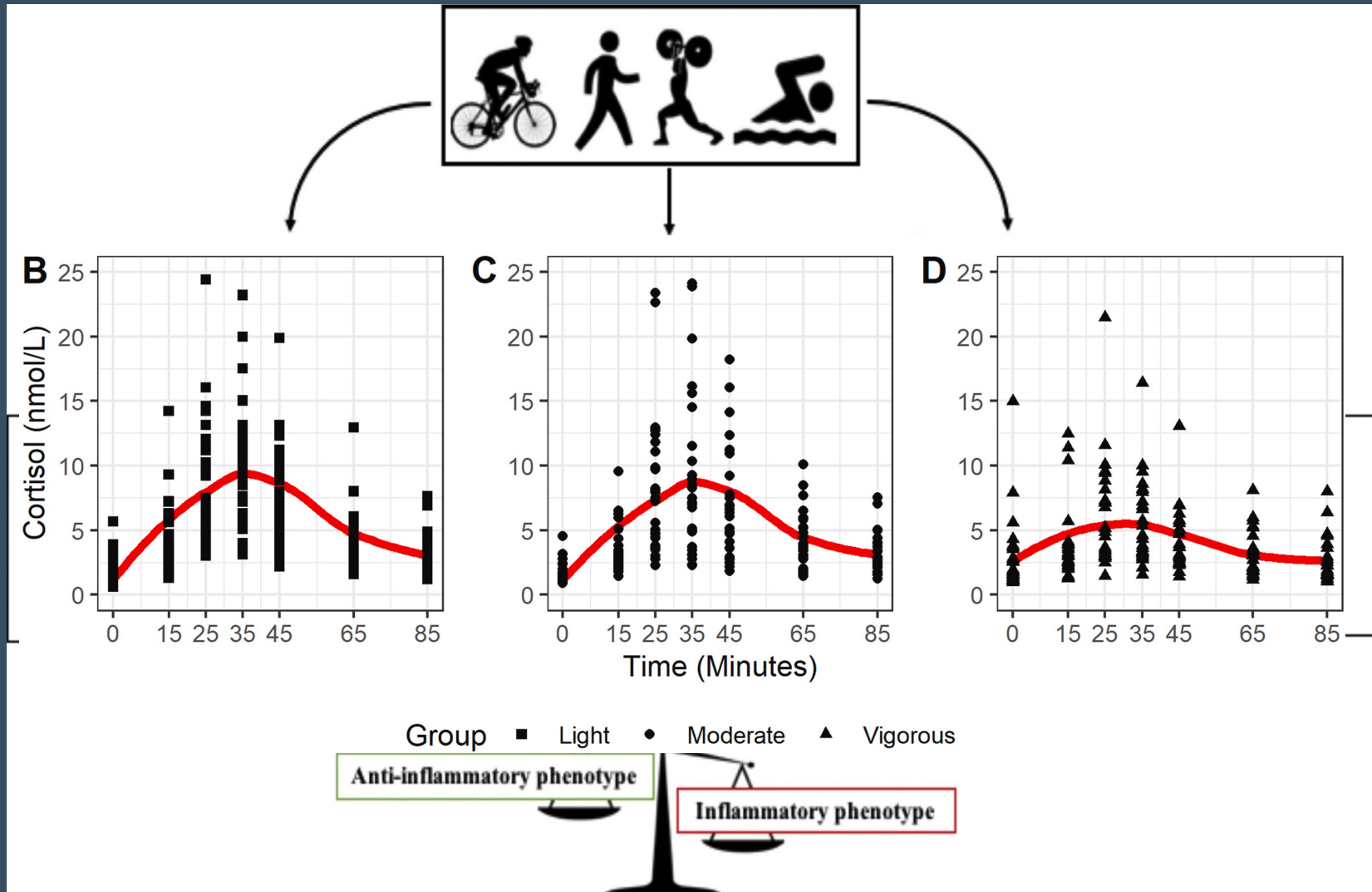
- Counter stigma
- No definitive answers
- Support for other symptoms



# Alzheimer Prevention

- Hearing loss (8.2%)
- Less education (7.1%)
- **Smoking (5.2%)**
- **Depression (3.9%)**
- **Social Isolation (3.5%)**
- **TBI (3.4%)**
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- **Physical inactivity (1.6%)**
- **Diabetes (1.1%)**
- **Alcohol (0.8%)**
- **Obesity (0.7%)**

# Stress



# Stress

- Meditation
  - Lower blood cortisol and inflammation markers
  - Reduced self-reported stress



# Promoting Resilience

- Ask about stress
- Have community resources ready
- Exercise
- Meditation





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# Thank You!

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**Every life deserves world class care.**