The Curves of “Normal” Aging

Diagram showing different curves for Verbal, Performance, and Memory over the age range of 16-74.
Alzheimer’s Disease (AD)

- Alzheimer’s disease is an irreversible, progressive brain disorder that slowly destroys memory and thinking skills, and eventually the ability to carry out the simplest tasks.

- The most common cause of dementia among older adults.
  
  **Dementia** is the loss of cognitive functioning—thinking, remembering, and reasoning—and behavioral abilities to such an extent that it interferes with a person’s daily life and activities.

- 6th leading cause of death in the US, just behind heart disease and cancer.

- One in nine people age 65 and older (11%) has AD.
Changes in the Brain: Pathological Features

Damage to the brain starts a decade or more before memory and other cognitive problems appear

- **Amyloid plaques** - Found in the spaces between neurons, plaques consist predominantly of abnormal deposits of a protein fragment called beta-amyloid.

- **Neurofibrillary tangles** - Found inside neurons, neurofibrillary tangles are abnormal clumps of a protein called tau.

- Loss of connections between neurons in the brain and cell death.

- **Brain atrophy** (shrinking)
Why are some people at a higher risk for AD than others?
DNA: the Molecule of Life

23 pairs of chromosomes

Gene

3 billion genetic letters in the human genome
A **single nucleotide polymorphism (SNP)** is a variation in which single nucleotide may occur at some specific position in the genome, where each variation is present to some appreciable degree within a population.
Genome Wide Association Studies (GWAS)

Examination of many common genetic variants in different individuals to see if any variant is associated with a trait.

500K-1 million tag SNPs – genetic markers – that represent 3 billion genetic letters in the human genome.
Can we reduce the risk?

✓ **Adapt a healthy diet.** Eat a heart-healthy diet that benefits both your body and your brain. Adopt a diet that is lower in fat and higher in vegetables and fruit.

✓ **Challenge your brain.** Mentally/cognitively challenging activities, such as learning a new skill or engaging in formal education, may have short and long-term benefits for your brain.

✓ **Enjoy socially activity.** Social engagement is associated with reduced rates of disability and mortality, and may also reduce risk for depression.

✓ **Be physically active.** Physical activity is a valuable part of any overall body wellness plan and is associated with a lower risk of cognitive decline.