

# Late Adulthood Cognitive & Physical Development



# Physical Development

## Can We Help Each Other?



# Late Adulthood

## Gains

Wisdom

Growth with the Lord

Experience

Integrity

Becoming grandparents

Inner strength

## Losses

Loss of brain cells

Loss of intellectual capabilities

Loss of energy

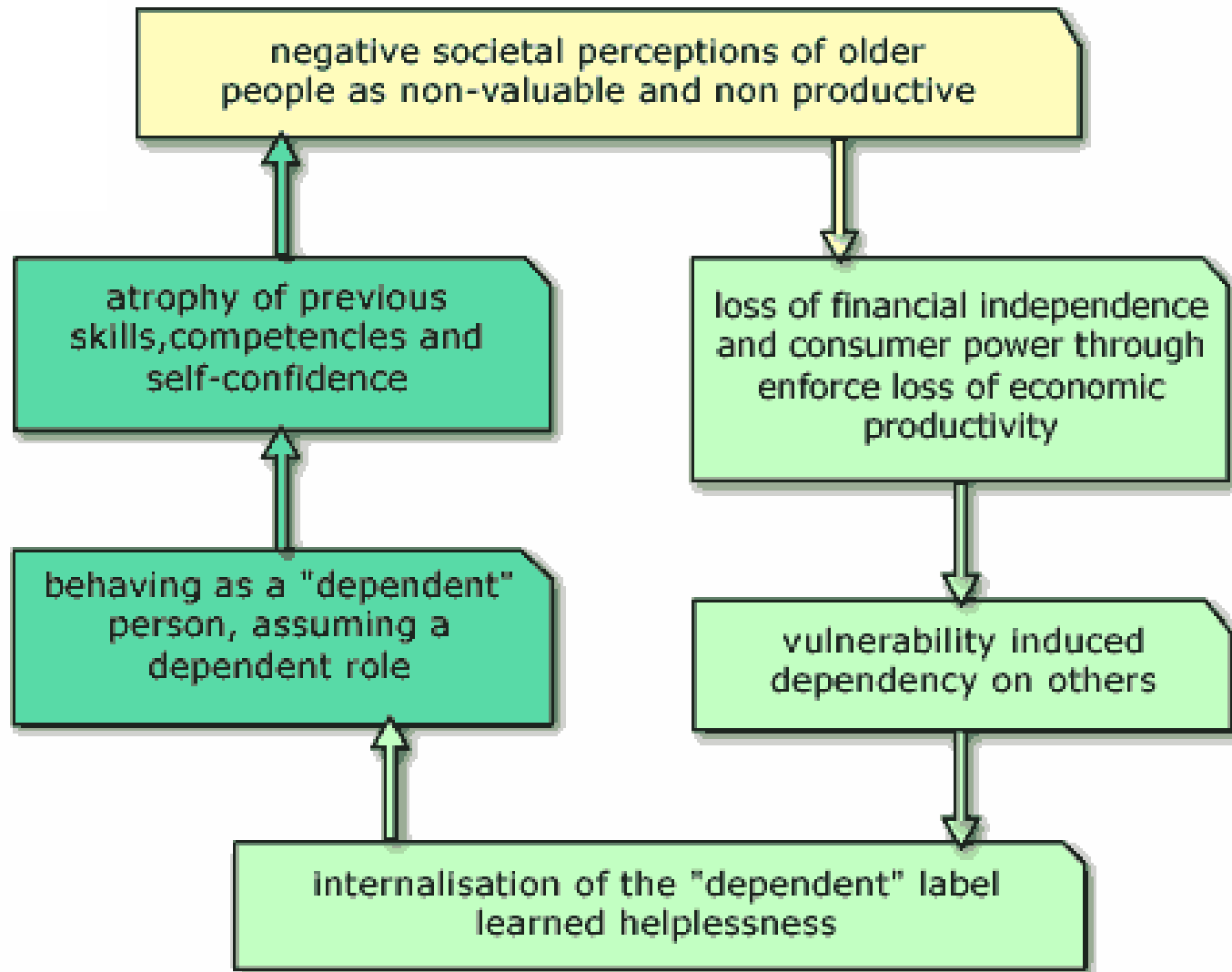
Loss of sex drive

Loss of friends & family

# Ageism

## Prejudice Against Older People

- 1- Negative attitudes about older people regarding competence & attractiveness
- 2- Identical behavior by an older person and a younger one is interpreted differently.
- 3- People use baby talk to address older people in nursing homes
- 4- Job discrimination
- 5- Misinformation



The cycle of structurally induced dependence (source: adapted from Kuypers JA, Bengtson VL Perspectives on the olderfamily. In: Quinn WH, Hugston GA, eds Independent ageing. Rockville: Aspen Publications, 1984).

# Ageism

## GOOT



# Wrinkles

- The skin loses its elasticity and collagen , the protein that forms the basic fibers of body tissue.

# Osteoporosis

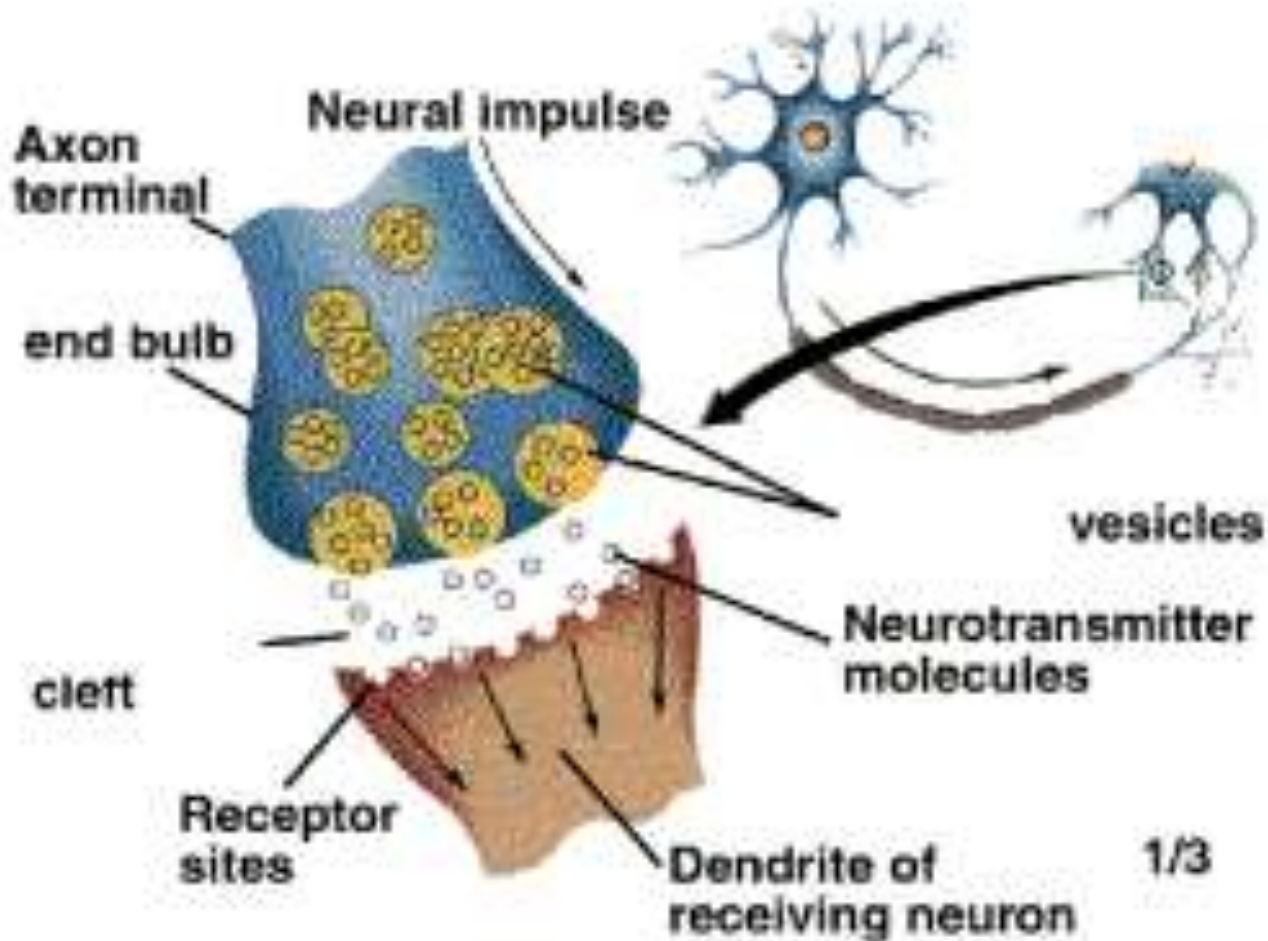
- Bones become brittle and fragile
- Brought about by lack of calcium
- 25% of women over 60 have osteoporosis
- It is the primary cause of broken bones
- It is preventable with sufficient calcium and exercise.



# The Brain

- A reduction of the blood flow to the brain
- The space between the skull and the brain doubles
- The number of neurons declines in some parts of the brain, though not as much as was once thought

# How Do Neurons Communicate?



# The Structure of the Brain

- **1- Dendrites**

Act like antennas receiving messages

- **2- The Cell Body**

Contains the biochemical machinery to keep the neuron alive

- **3- The Axon**

Transmits messages away from the cell body to other neurons

# Digestive System

- Produces less digestive juice
- Is less efficient in pushing food through the system
- The result is constipation

# The Heart

- The arteries harden
- The blood vessels shrink
- Reduction in the capacity of the heart to pump blood through out the circulatory system
- A 75-year-old's heart pumps less than three-quarters of the blood it pumped during early adulthood

# Slowing of Reaction Time

- **Peripheral Slowing Hypothesis**
- **Generalized slowing Hypothesis**

# Nervous System

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graph TD; NS[Nervous System] --> CNS[Central Nervous System (CNS)]; NS --> PNS[Peripheral Nervous System]; CNS --> Brain[Brain]; CNS --> SpinalCord[Spinal Cord]; PNS --> Somatic[Somatic Division]; PNS --> Autonomic[Autonomic Division];
```

**Central Nervous System (CNS)**

**Peripheral Nervous System**

**Brain**

**Spinal Cord**

**Somatic Division**

**Autonomic Division**

# Peripheral Nervous System

**Somatic Division**

**Autonomic Division**

**Parasympathetic Nervous System**

**Sympathetic Nervous System**



# 1- The Peripheral Slowing Hypothesis

- The overall processing speed declines in the peripheral nervous system.
- It takes longer for information to reach the brain.
- It takes longer for commands from the brain to be transmitted to the body muscles

## 2- The Generalized Slowing Process

- Processing in all parts of the nervous system is less efficient due to loss of neurons
- They are unable to receive efficiently information from the environment to indicate a dangerous situation
- Their decision process may be slower and their ability to remove themselves from harm is impaired

# Vision

- Lens becomes less transparent and the pupils shrink
- The optic nerve becomes less efficient
- Distant object becomes less acute
- More light is needed to see
- It take longer to adjust to a change from light to darkness and vice versa.
- Driving at night becomes difficult
- Reading becomes more of a strain

# **Vision**

## **Cataracts**

- **Cloudy or opaque areas of the lens of the eye that interfere with passing light**
- **Can be surgically removed**
- **Intraocular lens implants can replace old lens**

# Vision

## Glaucoma

- Occurs when pressure in the fluid of the eye increases,
  - either because the fluid cannot drain
  - Or because too much fluid is produced
- It can be corrected with drugs or surgery
- It must be detected early enough

# Age Related Macular Degeneration

- Affects the macula, a yellowish area of the eye located near the retina at which visual perception is most acute

# Hearing

- 50% of adults over 75 have hearing loss
- High frequencies are the hardest to hear
- Hearing aids would be helpful 75% of the time, but only 20% of people wear them
- Hearing aids amplify all sounds so it is difficult to discern conversations
- Some people withdraw from society because they feel left out and lonely

# Psychological Problems

- A result of cumulative losses
- Declining health may contribute to psychological problems
- Anxiety may be caused by inappropriate drug dosage
  - Changes in metabolism
  - The effects of drug interaction



# **Dementia**

## **Causes for Cognitive Decline**

### **1- Primary Causes**

**Alzheimer's Disease**

**Strokes**

### **2- Secondary Causes**

**Mental health**

**Depression**

**Judgment about our abilities**

# Secondary Causes of Cognitive Decline

- Physical fitness
- Nutritional deficits
- Use of alcohol
- Prescription and over-the-counter drugs
- Disuse of mental functioning

# Alzheimer's Disease

- Progressive brain disorder that produces loss of memory and confusion
- Drugs only help about 20%
- Symptoms:
  - Unusual forgetfulness
  - Trouble recalling certain words
  - First recent memory goes, then older ones
  - Confusion and inability to recognize family members
  - Loss of muscle control

# Causes of Alzheimer's Disease

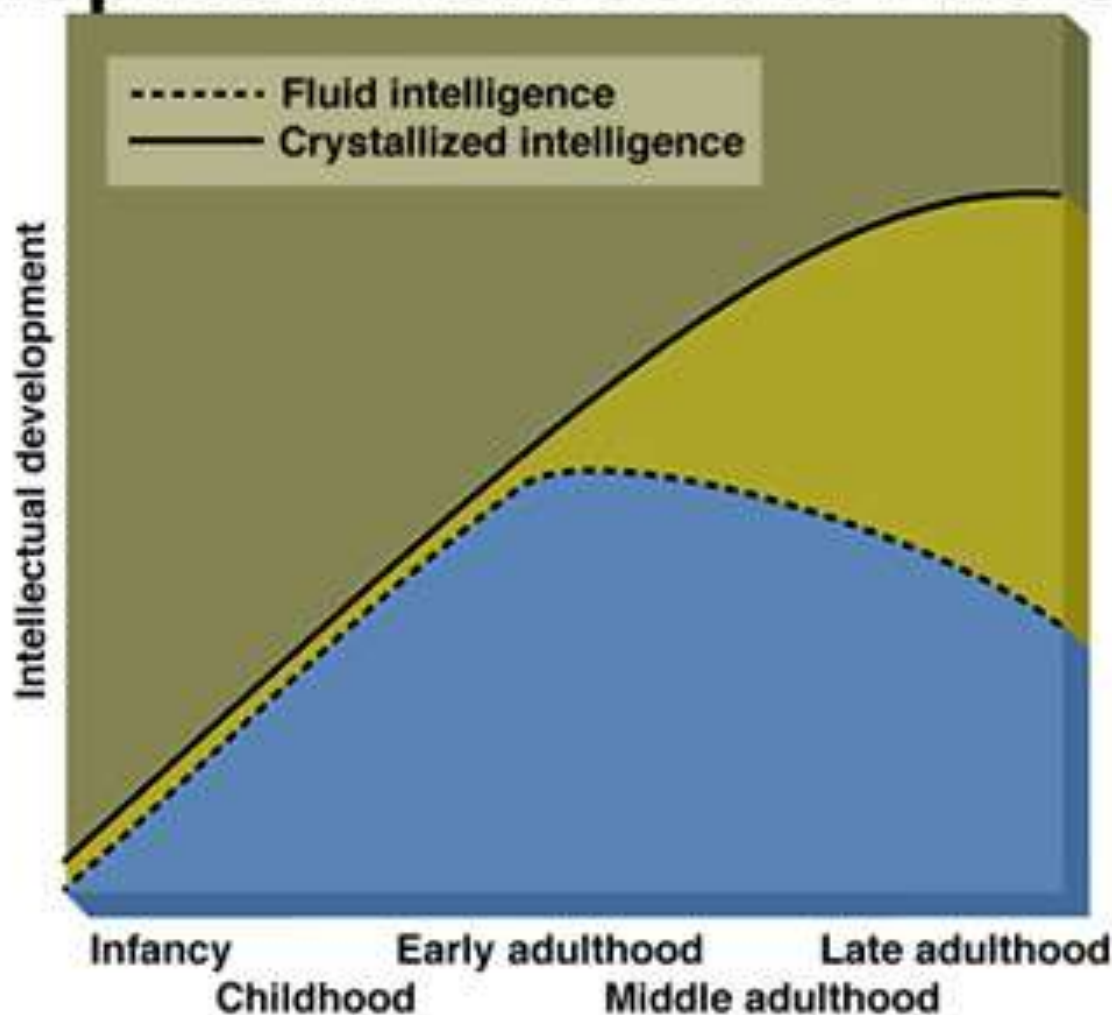
- The brain shrinks
- Several areas of the hippocampus and frontal and temporal lobes deteriorate
- Certain neurons die and create a lack of acetylcholine
- It runs in families

# Cognitive Development

## Schaie's Studies

- Results show no uniform pattern of adulthood age-related changes across all intellectual abilities
- **Fluid intelligence** decline starting age 25
- **Crystallized intelligence** stay steady or increase
- Training can improve reasoning and spatial skills

# Fluid and Crystallized Intellectual Development Across the Life Span



# Lesser Declines in Intellectual Abilities Are Due to:

- Good health
- High SES
- Involvement in an intellectually stimulating environment
- A flexible personality
- Being married to bright spouse
- Feeling self-satisfied with one's accomplishments in middle and early old age

# Memory

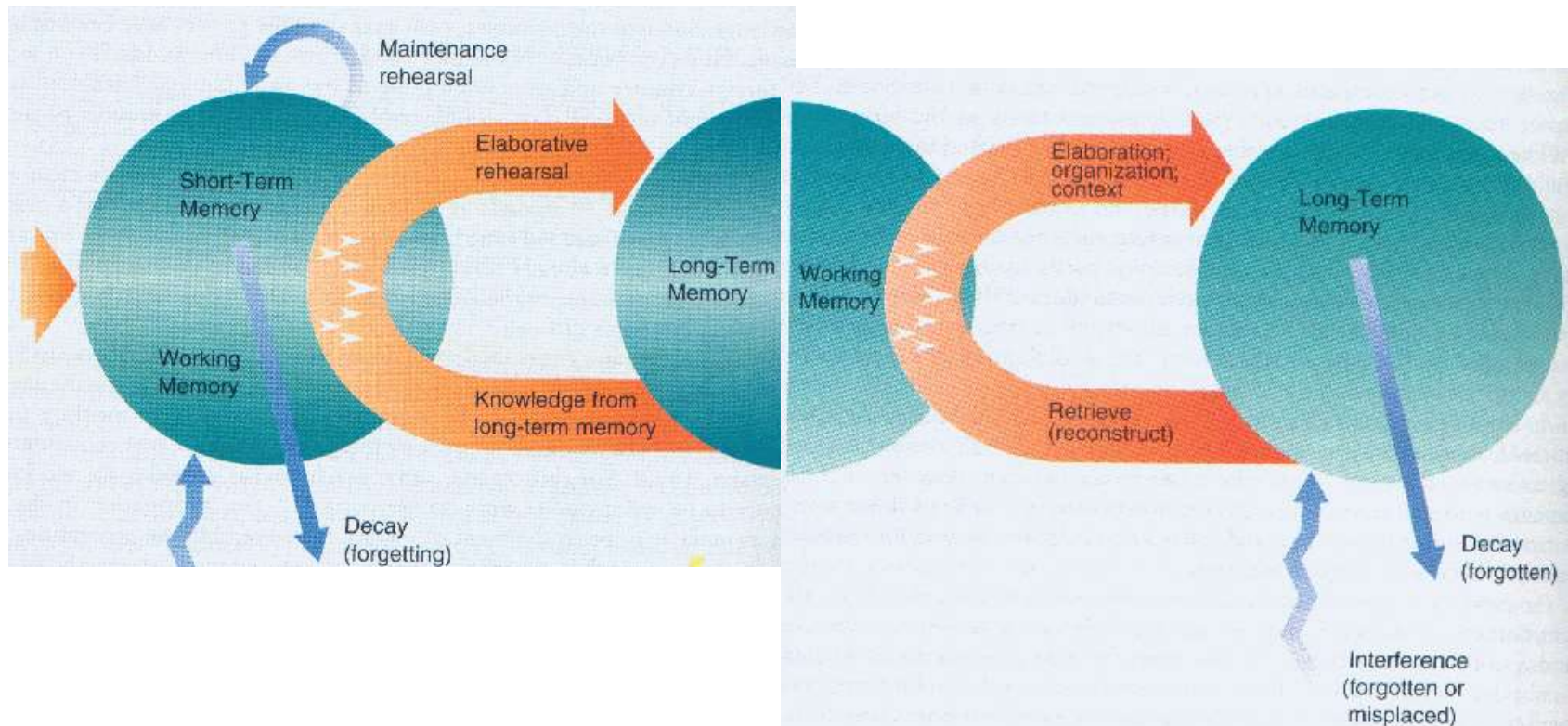
- People are less likely to experience memory loss in societies where older people are held in high esteem
- Memory losses occur primarily to **episodic memory**
- **Semantic memories** and **implicit memories** are largely unaffected by age
- **Short-term memory** declines gradually until age 70



# Memory

- Information presented quickly and verbally is forgotten sooner
- New information is more difficult to remember because it is not processed as efficiently
- **Autographical memories** follow the **Pollyanna Principle**, in which pleasant memories are more likely to be recalled

# Long Term and Short Term Memory



# Wisdom

- An expert knowledge system focusing on the pragmatics of life that involves excellent judgment and advice on critical life issues , including the meaning of life and the human condition; wisdom represents the capstone of human intelligence.

# **Five Categories of Wisdom**

## **Paul Blates**

- 1- Factual knowledge**
- 2- procedural knowledge**
- 3- Lifespan-contextualism**
- 4- value relativism**
- 5- uncertainty**

# Five General Characteristics of Wisdom

## Paul Blates

- 1- Focuses on important matters related to the meaning of life and human condition
- 2- The level of knowledge, judgment, and advice reflected in wisdom is superior.
- 3- The knowledge associated with wisdom has extraordinary scope, depth, and balance and is applicable to specific situations.

# Five General Characteristics of Wisdom

## Paul Blates

- 4- Wisdom combines mind and virtue and is employed for personal well-being as well as for the benefit of humankind.
- 5- Though difficult to achieve, wisdom is easily recognized by most people.

# Theories of Aging

## **Senescence**

The normal aging process, not connected with the occurrence of disease in the individual

# Why Do We Age?

- **Genetic Preprogramming/Biological Clock Theories of Aging**

Suggest that the programmed actions of specific inherited genes determine aging

- **Wear-and-tear/Stochastic Theories of Aging**

Suggest that the body ages as a result of random assaults from both internal and external environments



# Genetic Preprogramming

## Theories of Aging

- Our body's DNA genetic code contains a build-in time limit for the reproduction of human cells
- Genetic material has a "death gene" that is programmed to direct the body to deteriorate and die
- There is some sort of timer in the hypothalamus and the pituitary gland. The pituitary gland releases a hormone after puberty that begins the process of decline throughout the rest of the lifespan at a programmed rate

# Wear-and-Tear/Stochastic Theories of Aging

1- As cells age, they are less efficient in disposing of wastes. Extra substances, particularly a fatty substance called **lipofusein**, accumulate in blood and muscle cells. Eventually, these substances take up space and slow down normal cell processes.

# **Wear-and-Tear/Stochastic Theories of Aging**

**2- In the course of normal use of oxygen for virtually every cellular process, small, highly charged, unpaired electrons are left over. These **free radicals** react with other chemical compounds in the cell and may interrupt normal cell functioning.**

# **Wear-and-Tear/Stochastic Theories of Aging**

**3- It is known that ultraviolet light in sunshine can **damage the DNA** in skin cells. In this case, the cell either repairs itself or dies and is replaced. In older people such repairs are less efficient.**





# **Wear-and-Tear/Stochastic Theories of Aging**

**4- Sometimes connective tissue, or the **cross-links** between cells, is affected. It loses some of its flexibility and become rigid. Also, the immune system becomes less efficient.**

# Wear-and-Tear Theories of Aging

- The mechanical functions of the body simply wear out with age
- The body's constant manufacture of energy to fuel its activities create by-products, which eventually reach such high levels that they impair the body's normal functioning
- Longevity can be extended by eliminating the toxins produced by the body

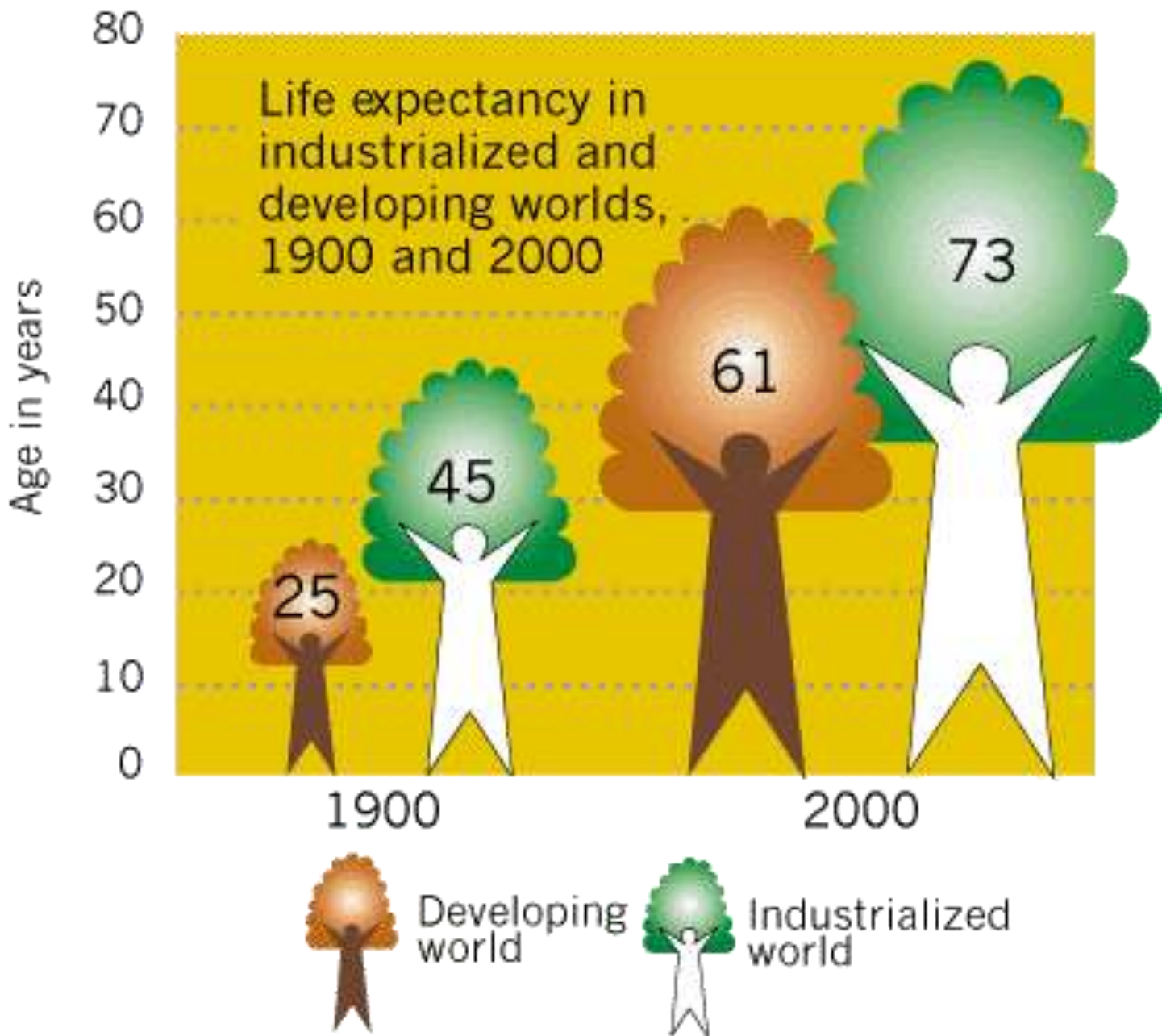
# Life Expectancy

• 1976		35
• 1900		47
• 1996		74
• 2050		80

# Life Expectancy

- **Caucasians in the U.S.** 76
- **African American** 71
- **Japanese** 79
- **Gambian** 45
- **Male in the U.S.** 73
- **Female in the U.S.** 80





# Stop and Discuss

- **For terminally ill patients, which is better to be treated at home or at the hospital?**
- **How do you feel about Euthanasia and living wills?**
- **Describe a funeral you have attended. What was different about it? How did you feel afterwards?**
- **What are your fears from death?**

# Imagine an ideal life and development

1- Write all the factors involved to guarantee successful aging:

cognitive, physical, social, emotional

2- Trace the development from the prenatal stage to old age. Cover these stages:

Prenatal, childhood, adolescence, early adulthood, middle adulthood, late adulthood