Physical Growth

- The Course of Physical Growth
  - Changes in body size

An Interesting Head Count

Physical Growth in Infancy

- The Course of Physical Growth
  - Changes in body size
  - Changes in body proportion
    - cephalocaudal trend (from head to foot)
    - proximodistal trend (from center out)

Rapid advances

Figure 3.1. Height and Weight
Rhythms and States

Rhythms
- Repetitive, cyclical patterns of behavior

States
- Major body rhythm
- Degree of awareness to external and internal stimulation

Major States of Infancy

- Sleeping
- Eating
- Waking
- Elimination

Sleep: Perchance to Dream

- Major state
  - 16-17 hours daily
- Different than adult sleep
  - 2 hour spurts; periods of wakefulness
  - Cyclic pattern
- By 16 weeks sleep about 6 continuous hours;
  by 1 year sleep through night

REM Sleep

- Period of active sleep
- Closed eyes begin to move in a back-and-forth pattern
- Makes up around one-half of infant sleep
- May provide means for brain to stimulate itself through autostimulation
So what is a healthy caloric allotment for infants?

- About 50 calories per day for each pound of weight
- Most infants regulate caloric intake quite effectively on their own
- If allowed consume as much they seem to want and not pressured to eat more, they will be healthy

Malnutrition

- Children living in many developing countries
- Slower growth rate
- Chronically malnourished during infancy = lower IQ score later

Introducing Solid Foods: When and What?

- Solids can be started at 6 months but are not needed until 9 to 12 months (AAFP)
  - Introduced gradually, one at a time
  - Cereal → strained fruits

Preschooler Nutrition

- Slower growth = less caloric requirements
- Children can maintain appropriate intake of food, if provided with nutritious meals
- Inappropriate encouragement to increase food intake beyond an appropriate level may cause obesity
Preschool Physical Growth

By age 2
• 25 to 30 pounds
• Close to 36 inches tall

By 6 years old
• About 46 pounds
• 46 inches tall

Preschool Height and Weight

Preschool Individual Differences in Height and Weight
• Averages mask great individual differences in height and weight
• Gender differences
• National and global economic differences

Preschool Changes in Body Shape and Structure
• Bodies vary in height, weight, and shape
• Preschooler fat burns off
• Internal physical changes occur
Childhood: See How We Grow!

*Slow but steady…*

- Height changes
- Weight changes
- Only time in life span when on average girls taller than boys
- Variation in heights up to 6 inches not unusual

Growth During Adolescence

Figure 3-4. Growth Patterns

Can you see why it is called an adolescent growth spurt?

Physical Manifestations of Puberty

Rapid growth

Development of primary and secondary sex characteristics

Changes in body composition

Changes in circulatory and respiratory systems

The Growth Spurt

- **Puberty** =
  - adolescent growth spurt + sexual maturation

- Girls start (11) & peak (12) earlier than boys (13, 14)
- Boys build more muscle and heart & lung capacities
- Girls gain more fat
Sexual Maturation

• **Primary Sexual Characteristics**
  - Maturation of the reproductive organs
    - **girls**: menarche
    - **boys**: spermarche

• **Secondary Sexual Characteristics**
  - Other visible parts of the body that signal sexual maturity
    - **girls**: breasts
    - **boys**: facial hair, voice change
    - **both**: underarm hair

Pubertal Timing

• Individual differences
  - Genes + Nutrition/health
  - Stress
  - Early maturing
  - Late maturing
    - **girls** (14/15+)
    - **boys** (15/16+)

Summary of Changes in Adolescence: Sexual Maturation

Physical Growth Summary: 2-20 yrs
Physical Growth Summary

- The Course of Physical Growth
  - Changes in body size
  - Changes in body proportion

Factors in Cultural Patterns of Growth

- Sufficient or insufficient nutrition
- Disease
- Genetic inheritance
- Familial stress

- Secular Trend??
Physical Development and the Senses in Early Adulthood

- Physical development and maturation complete
- Peak of physical capabilities
- Brain wave patterns show more mature patterns
- Senses are peak
- Most professional athletes at peak during early adulthood

Ups and Downs of Midlife

- Emotional reactions to physical changes depend in part on their self-concepts
- Self-image is tied closely to one’s physical attribute
- But...middle-aged adults generally report no less satisfaction with their body images than younger adults

Primary and Secondary Aging

- **Primary aging**, or senescence, involves universal and irreversible changes due to genetic programming
- **Secondary aging** encompasses changes that are due to illness, health habits, and other individual factors, which are not inevitable

Secondary Aging and Negative Change

- Lifestyle decisions, including the use—or abuse—of alcohol, tobacco, or drugs or engaging in unprotected sex, can hasten secondary aging
- This can also increase a young adult’s risk of dying
You know you are aging when...

Grey and white hair
   thinner (hair that is!)

Wrinkles

Diminishing height

Osteoporosis

*Bones become brittle, fragile, and thin, often brought about by a lack of calcium in the diet*

25 percent of women over 60 have osteoporosis

Largely preventable with sufficient calcium and exercise

Double Standard

Women, especially in Western cultures, suffer from the *double standard* for appearance

Women who show signs of aging are judged more harshly than men

Women are more likely to dye their hair or undergo cosmetic surgery

Changes in Internal Function

Brain becomes smaller and lighter with age
   – Reduction of blood flow to the brain
   – Space between the skull and the brain doubles from age 20 to 70
   – Number of neurons, or brain cells, declines
Decline with Age in Brain Size

A 75-year-old's heart pumps less than three-quarters of the blood it pumped during early adulthood. Efficiency of the respiratory system declines with age. Digestive system produces less digestive juice and is less efficient in pushing food through the system.

All Systems Go...or Gone?

GERONTOLOGISTS

Specialists who study aging

- Late adulthood as a period of considerable diversity in which people change
- Growth in some areas, decline in others

Demographics of Aging

Figure 3-6. The Elderly Population Worldwide
Early Adulthood
Physical Development

One of the Best Pay-Offs: Longevity

Secondary Aging
• Lifestyle decisions, including the use—or abuse—of alcohol, tobacco, or drugs or engaging in unprotected sex, can hasten secondary aging
• This can also increase a young adult’s risk of dying

Physical Disabilities in Young Adulthood: Coping With Physical Challenge
• Some 50+ million Americans are physically challenged
  – Fewer than 10% of people with major handicaps have finished high school
• Fewer than 25% of disabled men and 15% of disabled women work full time
  – Adults with handicaps are often unemployed or stuck in routine, low-paying jobs
Female Climacteric

- Starting about age 45, transition from being able to bear children to being unable to do so
- Lasting about 15 to 20 years
- Menopause

The Psychological Consequences of Menopause

- Early research
  - Menopause linked directly to depression, anxiety, crying spells, lack of concentration, and irritability
- Current research
  - Normal part of aging that does not, by itself, produce psychological symptoms
- Effects influenced by personal and cultural expectations of menopause

Male Climacteric

- Male changes during middle age
  - Period of physical and psychological change relating to male reproductive system that occurs during late middle age.
  - Enlargement of the prostate gland
  - Problems with urination, including difficulty starting to urinate and frequent need to urinate during night
- Men still produce sperm and can father children through middle age

Senescence

- Influences
  - genetic
  - lifestyle
  - environment
  - historical period
- Multidimensional and multidirectional
  - average lifespan increased 20–25 years over past century
Physical Transitions

Primary Aging  Secondary Aging

You know you are aging when...

- Grey and white hair; thinner
- Wrinkles
- Diminishing height