Chapter 1

WHY PHYSICAL FITNESS?

Chapter 1 Objectives

- Understand the health and fitness consequences of inactivity
- Identify the major U.S. health problems
- Learn how to monitor daily activity level
- Learn the Physical Activity Guidelines for Americans
- Describe the differences between physical activity and exercise
- Define physical fitness and the dimensions of wellness
- Differentiate between health and physical fitness standards
- Point out the benefits and significance of participating in a wellness program
- List the national health objectives for 2020
- Determine if you can safely participate in an exercise program
- Learn how to measure resting heart rate and blood pressure

Major threat to health in America is inactivity

- **Health**
  State of complete well-being – not just the absence of disease or infirmity

- **Physical activity is no longer a natural part of our existence**
  - Advances in technology
  - Automated society

- **Sedentary Death Syndrome (SeDS)**
  - Cause of deaths attributed to a lack of regular physical activity
  - SEDS is the second greatest threat to U.S. public health
We need to increase physical activity
- Better health, longevity, quality of life, and well-being
- Prevention is the best medicine

Chronic diseases
Illnesses that develop and last a long time; rate of chronic disease has increased

Average life expectancy in the U.S.
- 75.7 years for men and 80.8 years for women
- Ranking: 38th in world
- Surprising given the U.S.’s excellent medical care system

Three factors affect health and longevity
1. Genetics
2. Our environment
3. Our behavior

We have control over 84% of disease vulnerability
Physical activity and exercise

- **Physical Activity**
  - Bodily movement produced by skeletal muscles
  - Produces health benefits
  - Requires low to moderate intensity effort

- **Exercise**
  - Type of physical activity that requires planned, structured and repetitive bodily movement to improve or maintain one or more components of physical fitness
  - Usually requires vigorous effort

Moderate physical activity improves health

- **Moderate Physical Activity**
  - Activity that uses 150 calories of energy per day, or 1,000 calories per week
  - Recommendations to meet this activity level:
    - Perform the activity in 30-minute continuous segments over 5 days
    - If not possible, perform three sessions of 10 minutes per day, 5 days per week
  - Institute of Medicine recommends a higher level of activity: 60 minutes of moderate activity daily

Daily Physical Activity Recommendations

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Duration</th>
<th>Intensity</th>
<th>Frequency per Week</th>
<th>Weekly Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>30 min</td>
<td>N*</td>
<td>≥5 times</td>
<td>≥150 min</td>
</tr>
<tr>
<td>Health and fitness</td>
<td>≥30 min</td>
<td>V*</td>
<td>≥3 times</td>
<td>≥75 min</td>
</tr>
<tr>
<td>Health, fitness, and weight gain prevention</td>
<td>≥45 min</td>
<td>M/M</td>
<td>5-7 times</td>
<td>≥205 min</td>
</tr>
<tr>
<td>Health, fitness, and weight gain prevention</td>
<td>≥45-90 min</td>
<td>M/M</td>
<td>5-7 times</td>
<td>≥420 min</td>
</tr>
</tbody>
</table>

* N* = moderate intensity, V* = vigorous intensity
* M/M = This may use MI or VI or a combination of the two
Federal Guidelines for Weekly Physical Activity

**Adults and older adults**
- 2 hours and 30 minutes of moderate activity OR
- 1 hour and 15 minutes of vigorous exercise*
- Strength building 2 days/week

**Gain more benefits with increased aerobic exercise**
- Increase moderate activity to 500 minutes OR
- Increase vigorous activity to 2 hours and 30 minutes

*Or, an equivalent combination of both

Federal Guidelines for Weekly Physical Activity

**Children 6 years of age and older and Adolescents**
- 1 hour or more per day of moderate or vigorous activity with 3 days having vigorous-intensity activity
- Strength building activities 3 days/week

**Pregnant and Postpartum Women**
- Women who are not already doing vigorous exercise should get 2 hours and 30 minutes of moderate exercise spread out over week
- Women who regularly engage in vigorous exercise can continue and should talk with health care provider about their activity level

To achieve increased quality and years of healthy life and seeking to eliminate health disparities, objectives address three important points:

1. **Personal responsibility for health behavior**
2. **Health benefits for all people and communities**
3. **Health promotion and disease prevention**
National Physical Activity Plan

Strategies to increase physical activity of whole population
- Policies for business and schools to promote physical activity
- Early childhood education
- Improve access and opportunity to physical activity
- Establish performance measures for active travel
- Enhance parks and recreation infrastructure

Monitor daily activity with a pedometer

**Pedometer**: a device that senses body motion and counts footsteps
- Active lifestyle = 10,000 steps/day

**TABLE 1**

<table>
<thead>
<tr>
<th>Steps per Day</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;3,000</td>
<td>Sedentary  lifestyle</td>
</tr>
<tr>
<td>3,000–7,499</td>
<td>Low active</td>
</tr>
<tr>
<td>7,500–9,999</td>
<td>Somewhat active</td>
</tr>
<tr>
<td>10,000–12,499</td>
<td>Active</td>
</tr>
<tr>
<td>≥12,500</td>
<td>Highly active</td>
</tr>
</tbody>
</table>

Monitoring Daily Physical Activity

- U.S. adults are not sufficiently physically active
  - men take about 6,000 steps per day
  - Women take about 5,300 steps per day
  - 24% report no leisure activity; 14% are completely inactive
- Pedometers are a good way to determine activity level
  - They are inexpensive but verify its accuracy
  - Lab 1A
Monitoring Daily Physical Activity

<table>
<thead>
<tr>
<th>TABLE 3.3</th>
<th>Estimated Number of Steps to Walk or jog a Mile Based on Sex, Height, and Pace</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Walking</td>
</tr>
<tr>
<td></td>
<td>Male</td>
</tr>
<tr>
<td></td>
<td>5’9”</td>
</tr>
<tr>
<td></td>
<td>5’10”</td>
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<tr>
<td></td>
<td>5’11”</td>
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<td></td>
<td>6’0”</td>
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<td>6’1”</td>
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<td>6’8”</td>
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<td>6’9”</td>
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<td>7’0”</td>
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<td>7’7”</td>
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<td>7’8”</td>
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<td></td>
<td>7’9”</td>
</tr>
<tr>
<td></td>
<td>8’0”</td>
</tr>
</tbody>
</table>

Wellness, Fitness, and Longevity

- Because of increased participation in wellness programs, cardiovascular disease dropped 26 percent from 1960 to 2000.
- Inverse relationship between physical activity and premature mortality
  - Harvard alumni study
  - Aerobics Research Institute study
- Dose-response relationship between physical activity and health
  - Vigorous activity/Longer duration are preferred

Physical activity prolongs life
Vigorous activity further prolongs life

- **Vigorous physical activity**
  Any exercise that requires a metabolic equivalent task (MET) level equal to or greater than 6 METs. One MET is equivalent to energy used at rest.
- **Increased benefits over moderate activity**
  - Aerobic capacity is greater
  - Greater improvement in cardiovascular risk factors
- Ensure it is safe for you to perform vigorous activity before beginning a program

Physical fitness

Ability to meet the ordinary, as well as unusual, demands of daily life safely and effectively without being overly fatigued and still have energy left for leisure and recreational activities

Categories of fitness

**Health-related fitness**

- Fitness programs prescribed to improve the individual’s overall health
- Ability to perform activities of daily living without undue fatigue
- Conducive to low risk of premature hypokinetic disease
Categories of fitness

Skill-related fitness
- Fitness components important for success in skillful activities and athletic events
- Components...

Health fitness standards
- The lowest fitness necessary for maintaining good health, decreasing the risk for chronic diseases and lowering the incidence of muscular-skeletal injuries
- Measured through improvements in:
  - Cardiorespiratory endurance \( \text{VO}_{2\max} \): maximal amount of oxygen the body is able to utilize per minute of physical activity
  - Metabolic profile: measurement of plasma insulin, glucose, lipid and lipoprotein levels

Physical fitness standards
- Fitness level that allows a person to sustain moderate-to-vigorous physical activity without undue fatigue and the ability to closely maintain this level throughout life
- Higher than health standards and require a more intense exercise program
**Health and Fitness Benefits**

**Benefits of fitness**

**Health benefits**

Benefits are extensive and result in better quality of life and fewer health problems.

<table>
<thead>
<tr>
<th>TABLE 1.9 Long-term Benefits of Exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Increases and strengthens the cardiovascular system.</td>
</tr>
<tr>
<td>2. Decreases risk for diabetes, high blood pressure, and stroke.</td>
</tr>
<tr>
<td>3. Improves muscular strength and endurance.</td>
</tr>
<tr>
<td>4. Enhances flexibility and increases joint movement.</td>
</tr>
<tr>
<td>5. Decreases the likelihood of developing chronic diseases.</td>
</tr>
<tr>
<td>6. Reduces stress and anxiety.</td>
</tr>
<tr>
<td>7. Improves mental health and cognitive function.</td>
</tr>
<tr>
<td>8. Improves quality of life and overall well-being.</td>
</tr>
</tbody>
</table>

**Economic benefits**

Improved health increases productivity and reduces health care costs by preventing chronic disease.

![Graph showing economic benefits over time.](image)
Guidelines for a healthy lifestyle

- Begin lifestyle changes now to enhance quality of life during middle age and the ‘golden years’
- This text provides the tools to create a lifetime wellness plan
- An individualized approach is essential and labs focus on developing a personal plan

Prepare for an exercise program

- Before beginning an exercise program or exercise testing, evaluate your risk
- Exercise may not be safe for everyone
- Higher levels of cardiovascular exercise may cause unpredictable effects
  - Abnormal blood pressure
  - Irregular heart rhythm
  - Fainting
  - Rarely, heart attack or cardiac arrest

Assessment of Resting Heart Rate

- Check heart rate early in the morning before getting out of bed or in the evening after sitting for 30 minutes
- Bradycardia: slower heart rate than normal

<table>
<thead>
<tr>
<th>Heart Rate (beats/min)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;60</td>
<td>Dead</td>
</tr>
<tr>
<td>60-69</td>
<td>Safe</td>
</tr>
<tr>
<td>70-79</td>
<td>Average</td>
</tr>
<tr>
<td>80-89</td>
<td>Safe</td>
</tr>
<tr>
<td>&gt;90</td>
<td>Fast</td>
</tr>
</tbody>
</table>

*Dr. Gupta Leuca
Assessment of Blood Pressure

- Measured with sphygmomanometer and stethoscope
- Sphygmomanometer is inflated 30-40 mmHg above where pulse is no longer palpable
- Results are recorded as the cuff is deflated and sounds are heard through the stethoscope

Systolic Blood Pressure
Point where sound of pulse becomes audible

Diastolic Blood Pressure
Point where sound disappears

Resting blood pressure guidelines

<table>
<thead>
<tr>
<th>Rating</th>
<th>Systolic</th>
<th>Diastolic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>≤120</td>
<td>≤80</td>
</tr>
<tr>
<td>Prehypertension</td>
<td>120–139</td>
<td>80–89</td>
</tr>
<tr>
<td>Hypertension</td>
<td>≥140</td>
<td>≥90</td>
</tr>
</tbody>
</table>

Source: National Heart, Lung and Blood Institute.

Wellness

- Wellness is a constant and deliberate effort to stay healthy; with the goal to achieve highest potential for well-being
  - Personal choice
Seven Dimensions of Wellness

- Dimensions are frequently interrelated
  - Physical wellness
    - Most commonly associated with being healthy
    - Physically well individuals are physically active, exercise regularly, eat a well-balanced diet, maintain recommended body weight, get sufficient sleep, practice safe sex, minimize exposure to environmental contaminants, avoid harmful drugs, and seek medical care and exams as needed

- Emotional wellness
  - Express emotions, adjust to change, cope with stress, and enjoy life
  - Brings with it certain stability, an ability to look both success and failure squarely in the face and keep moving along a predetermined course
  - Happiness is the goal

- Mental wellness
  - Referring to as intellectual wellness
  - Brings with it vision and promise
  - Makes you open-minded and accepting of others

- Social wellness
  - Concern for others and interest in humanity
  - Honest and loyal; concern for oneself
  - Fuels a positive self-image
Seven Dimensions of Wellness

- Environmental wellness
  - Effects of our surroundings on our well-being
  - Health is negatively affected when we live in a polluted, toxic, unkind, and unsafe environment

- Occupational wellness
  - “Ideal” job – growth and contribution
  - Encourages collaboration and interaction among coworkers, which fosters a sense of teamwork and support

Seven Dimensions of Wellness

- Spiritual wellness
  - Provides a unifying power that integrates all dimensions of wellness.
  - Provides a sense of meaning and direction in life and a relationship to a higher being.
  - Studies have linked prayer, as long as they are sincere, to positive health outcomes
  - Altruism seems to enhance health and longevity.