HPS 1000 Summer 2015

Course Requirements

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TEXT: Hoeger, W.W.K. and Hoeger, Sharon A. (2014) *Principles and Labs for Fitness and Wellness (12th ed).* Belmont, CA: Wadsworth/Thompson Learning

All PowerPoint notes are available on my web page

There will be three exams given during the semester. Exam 4 will be given on the final exam day. Exam 4 is a cumulative exam. It may be used as a replacement grade for either exam 1, 2, or 3. If you miss any scheduled exam, you MUST take exam 4 to replace the missing test grade. *THERE ARE NO MAKE-UP EXAMS*.

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EVALUATION SCALE:

Exam I (Ch 1-4)	100 pts	A = 450 - 500
Exam II (Ch 5-8)	100 pts	B = 400 - 449
Exam III (Ch 9-11)	100 pts	C = 350 - 399
Labs (9 pts x 10)	90 pts	D = 300 - 349
Dietary Analysis	15 pts	F = Below 300
Pedometer Project*	15 pts	
Personal Fitness Report/Log	50 pts	
Attendance and Participation	30 pts	
Total	500 pts	

- *Utilization of a pedometer and completing the log of activity utilizing the pedometer.
- (http://www.kennesaw.edu/col_hhs/wellness/Walking_Log 12 weeks.xls)

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One key aspect of this course is the regular participation of each student in some form of individualized physical activity that improves fitness and is known to benefit health and lower risk for cardiovascular disease.

Time will be made available for activity and participation will be strongly encouraged.

Please inform your instructor if there are medical conditions which will limit or not allow you to be an active participant.

3

Chapter Two

Behavior Modification

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Figure 2.1
Exercise/exercise dropout cycle.

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Getting Serious About Behavior Change

1. Identify the wellness-related behavior that you want to change
2. Gather information and increase your knowledge
3. Understand your limitations and abilities
4. Don't go it alone - seek the advice and support of caring individuals

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What Does It Take to Change?

- Motivation
  - raising consciousness about the problem behavior helps create motivation to change
- Understanding your locus of control
  - what you consider to be the source of responsibility for events in your life
  - can be internal or external

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Locus of Control

The extent to which a person believes they can influence the external environment

Internal Locus of Control

Have control over events in their lives; generally are healthier; easier time adhering to wellness program

External Locus of Control

What happens to them is a result of chance or the environment and is unrelated to their behavior

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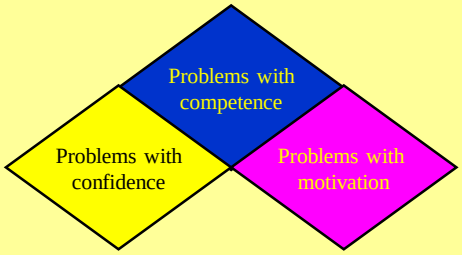
Impediments to Improving Internal Locus of Control



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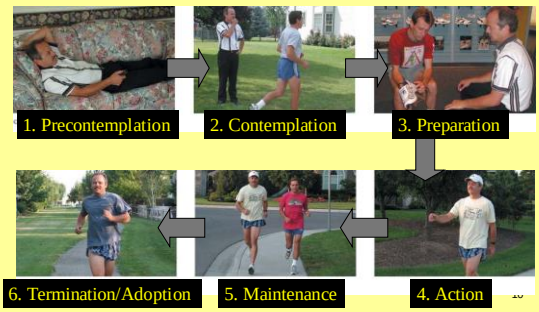
Transtheoretical Model

The Six Stages of Change Model



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Developing a Behavior Change Plan

1. Monitor behavior and gather data
2. Analyze the data and identify patterns
3. Set specific goals
4. Devise a strategy or plan of action
   a. modify environment
   b. create rewards
   c. involve others
5. Make a personal contract (See handout)

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Personal Contract

Development of Personal Fitness Report (Contract)

Your contract should include a statement of your goal(s) and your commitment to reaching it.

Details:

1) Type of activity used to reach personal goal(s)
2) The date you will begin
3) The steps you will use to measure your progress
4) The concrete strategies you will use to promote change
5) The date you anticipate reaching your goal(s)
6) Have an exercise partner sign as a witness.

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Staying With It

- Anticipate and overcome possible obstacles:
  - social influences
  - levels of motivation and commitment
  - choice of techniques and level of effort
  - stress barriers
  - procrastination, rationalization, blaming
- Get outside help if needed

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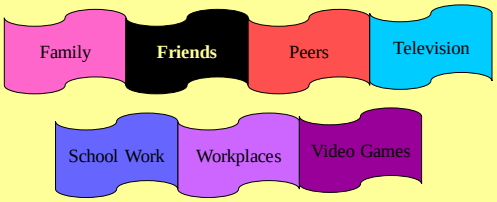
Factors Affecting Behavior



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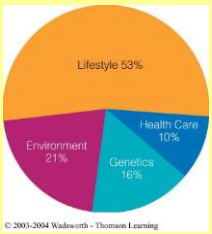
Factors That Affect Health and Well-Being



We can control 84% of disease and quality of life!!

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Chapter One

Physical Fitness and Wellness

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Defining Health

Webster's Dictionary

"the condition of being sound in body, mind and spirit…..freedom from physical disease or pain."

World Health Organization

"a state of complete physical, mental, and social well-being, not merely the absence of disease or infirmity."

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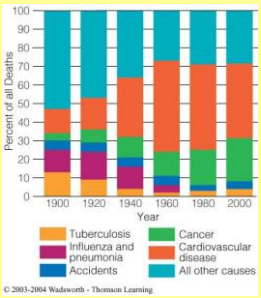
Causes of Death in the United States for Selected Years



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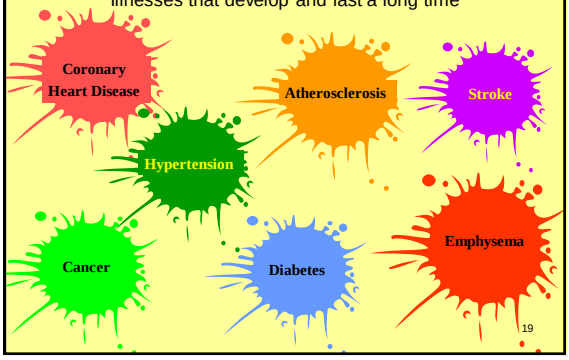
Common Chronic Diseases

Illnesses that develop and last a long time



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Wellness

The maximum level of well-being

More than absence from disease

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Figure 1.3 Seven Dimensions of Wellness.

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The 7 Dimensions of Wellness

1. **Physical wellness**: includes eating well; exercising; avoiding harmful habits; responsible decisions about sex; recognizing/learning about disease; getting regular medical & dental checkups; preventing injuries at home, on the road, and job
2. **Emotional wellness**: includes optimism, trust, self-esteem, self acceptance, self-confidence, self-control, satisfying relationships, and ability to share feelings

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The 7 Dimensions of Wellness – cont.

3. **Mental** (Intellectual) **wellness**: includes an active mind, openness to new ideas, capacity to question & think critically, motivation to master new skills, maintain sense of humor, creativity, & curiosity
4. **Spiritual wellness:** includes a set of guiding beliefs, principles, or values that give meaning & purpose to one's life

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The 7 Dimensions of Wellness – cont.

5. **Interpersonal and social wellness:** recognizes that satisfying relationships are basic to both physical & mental health; requires communication skills; capacity for intimacy; & development of a support network
6. **Environmental wellness:** our health depends on health of our planet and protecting against environmental hazards

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The 7 Dimensions of Wellness – cont.

7) **Occupational wellness:**

- **provides rewards that are important to the individual;**
- **not always salary (e.g. career changes);**
- **usually have some say about the demands that are placed upon them;**
- **unpredictable demands keep job exciting;**
- **can maximize, broader or gain new skills;**
- **opportunity for advancement & recognition of achievement**
- **encourages collaboration and interaction among co-workers**

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Figure 1.4 Wellness continuum.

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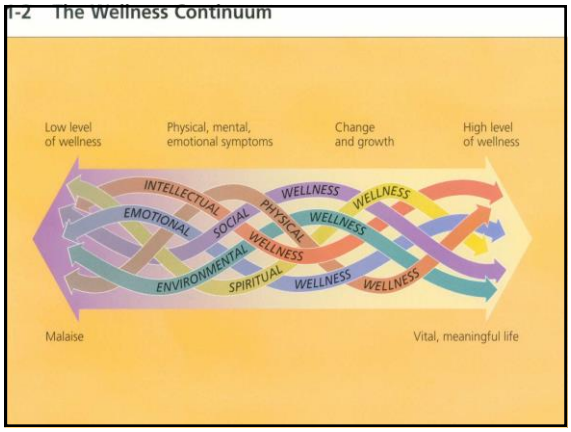

Behaviors Contributing to Wellness

- Healthy diet (Lower calories, fat, & added sugars; increase fiber & complex carbohydrates)
- Healthy body weight (One that is maintained over time) Epidemic of obesity
- Effective stress management (Poor mgt = increased susceptibility to disease)
- Avoidance of tobacco (linked to 7/10 causes of death in US) and other drugs; wise use of alcohol, if any (linked to 6/10 causes of death in US)
- Protection from disease and injury (Much under your control)
- Physical activity (Single most important choice)

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Basic Principles of Physical Fitness

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Fitness Definitions

1. **Physical Fitness:** the ability of the body to adapt to the demands of physical effort
2. **Physical activity:** any movement of the body that is carried out by the muscles and requires energy
3. **Exercise:** a planned, structured, repetitive movement designed specifically to improve or maintain physical fitness

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Overview of Physical Fitness

- All physical activity contributes to health
- To be physically fit, you must engage in exercise
  - only certain types of physical activities contribute to physical fitness
- Physical activity levels
  - Surgeon General's Report (1996)
    - **more than 60% of U.S. adults do not engage in the recommended amount of physical activity**
    - **25% of adults get no exercise at all**

Physical activity is more prevalent in men or women?
MEN

- Physical activity is more prevalent in more or less affluent individuals?
- **MORE AFFLUENT**
- Physical activity is more prevalent in more or less educated individuals?
- **LESS EDUCATED**

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Moderate Physical Activity

- ***Definition***: Using 150 calories of energy per day, or 1,000 calories per week.
- ***Translation***: 30 minutes of physical activity most days of the week.
- ***Results***: lower risk of developing or dying from heart disease, diabetes, colon cancer, and high blood pressure, and improved bone, muscle and joint health. Additional benefits include lower health care costs and higher quality of life.

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Recommendations of the Surgeon General's Report

- Moderate activity:
  - on most, preferably all, days of the week
  - a goal of burning 150 calories a day
- Examples of one day's moderate activity:
  - 30 minutes of brisk walking OR 15 minutes of running
  - 30 minutes of raking leaves
  - 2 10-minute bicycle rides OR two brisk 15- minute walks

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Health Fitness Standard

Strive for improvements in:

1. **Metabolic Profile: A measurement to assess risk for diabetes and cardiovascular disease through plasma insulin, glucose, lipid, and lipoprotein levels**
2. **Metabolic Fitness: Improvements in metabolic profile through moderate-intensity exercise program in spite of little or no improvement in physical fitness standards**
3. **Cardiorespiratory endurance: The ability of the lungs, heart, and blood vessels to deliver adequate amounts of O_2 to the cells to meet the demands of prolonged physical activity.**

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Five Health-related Components of Fitness

1. **Cardiorespiratory endurance:** prolonged large-muscle dynamic exercise at moderate-to-high levels of intensity
2. **Muscular strength:** the amount of force a muscle can exert with a single maximum effort
3. **Muscular endurance:** the ability to sustain a given level of muscle tension
4. **Flexibility:** ability of joints to move through their entire range of motion
5. **Body composition:** the proportion of fat-free mass and fat in a body

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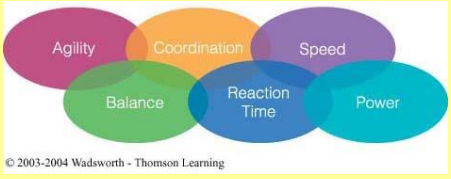
Motor-Skill Based Components of Fitness



Skill-related fitness – Fitness components important for the success in skillful activities and athletic events

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Skill Based Components of Fitness

1) **Agility:** The ability to change the position of the body quickly and accurately.
2) **Balance:** The ability to maintain equilibrium while moving or while stationary.
3) **Coordination:** The ability to perform motor tasks accurately and smoothly using body movements and senses.
4) **Power:** The ability to exert force rapidly, based on a combination of strength and speed.
5) **Reaction Time:** The ability to respond or react quickly to a stimulus.
6) **Speed:** The ability to perform a movement in a short period of time.

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Why Exercise?

1) Enhanced muscle mass and reduced body fat levels.
2) Increased resting metabolic rate.
3) Lowered blood pressure and cholesterol levels.
4) Lower risk of diabetes, heart disease, advanced osteoporosis and other common chronic diseases.
5) Enhanced immune system function.
6) Maintenance of flexibility, mobility and coordination.
7) Improved appearance, body image and confidence.
8) Reduced incidence stress, depression and anxiety.
9) Better quality of sleep and enhanced energy levels.

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Principles of Physical Training

Specificity: development of a particular fitness component requires exercises specifically designed for that component – the body adjusts to the stresses placed on it; the greater the demand – the greater the adjustment

Progressive overload: when amount of exercise is progressively increased

- **Frequency – How often the exercise is performed?**
- **Intensity – How difficult is the exercise?**
- **Duration – How long the exercise is performed?**

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Principles of Physical Training (cont.)

- Reversibility: the benefits of fitness are reversible – keep **intensity** if frequency & duration are reduced to maintain fitness - can loose up to 50% of fitness improvement within 2 months
- Individual differences: limits on adaptability – the potential for one to improve

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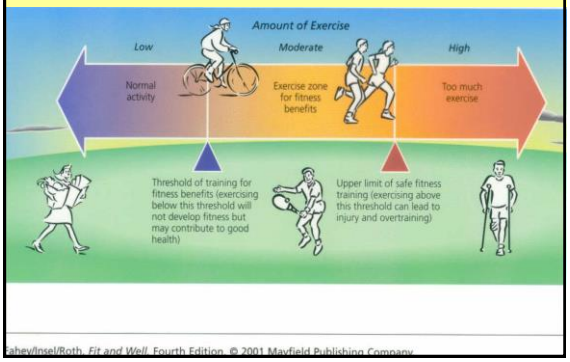
Amount of Exercise



Fahey/Insel/Roth, *Fit and Well*, Fourth Edition, © 2001 Mayfield Publishing Company

Choosing Activities for a Balanced Program

- Combine a physically active lifestyle with a systematic exercise program
- Levels of activity:
  - sedentary lifestyle, or beginner
  - moderate activity, or intermediate
  - top level, the highest intensity or activity level

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Tips on Training

1. Train the way you want your body to change
2. Train regularly
3. Get in shape gradually
4. Warm up and cool down

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Tips on Training - Continued

5. Listen to your body
6. Train with a partner
7. Train your mind
8. Keep your exercise program in perspective

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Putting Together a Complete Fitness Program

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Estimating Exercise Intensity

- ***Subject***: **20** year old
  - resting heart rate = 68 beats per minute (bpm)
- ***Maximal Heart Rate:***
  MHR = 207 – (.7 * age) = **193** bpm
- ***Resting Heart Rate*** (RHR) = **68** bpm
- ***Heart Rate Reserve*** (HRR)= MHR - RHR
  HRR = 193 – 68 = **125** BPM
- ***Goal***: 30-85% of heart rate reserve
  - 30% of Target Intensity (TI) = (125 x .30) + 68 = 106 bpm
  - 85% of Target Intensity (TI) = (125 x .85) + 68 = 174 bpm

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Rating of Perceived Exertion
(RPE Scale)

6-8 Very, very light

9-10 Very light

11-12 Fairly light

13-14 Somewhat hard

15-16 Hard

17-18 Very hard

19-20 Very, very hard

http://ksuweb.kennesaw.edu/~tdonovan/HPS1000/Estimating_Exercise_Intensity.xls

From G. Borg, "Perceived Exertion: A Note on the History and Methods," *Medicine and Science in Sports and Exercise*, 5 (1983):90-93.

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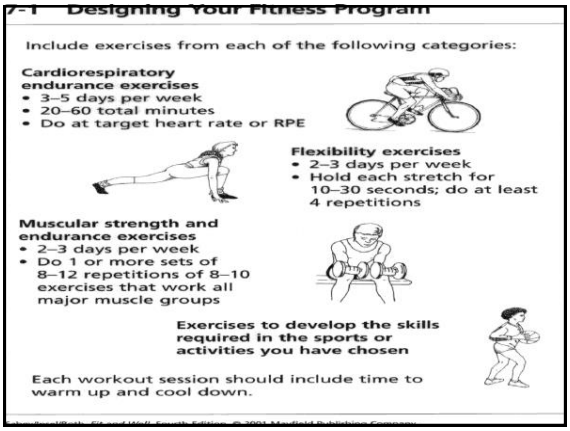

Developing a Personal Fitness Plan

1. Set goals

   Ask yourself what you want from your fitness program

2. Select activities

   Include activities to develop cardiorespiratory endurance, muscular strength and endurance, flexibility, and healthy body composition

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Developing a Personal Fitness Plan (cont.)

3. Set target intensity, duration, and frequency
4. Set mini-goals and rewards
5. Include lifestyle physical activity
6. Develop tracking tools (activity log or journal)
7. Make a commitment

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Putting Your Plan Into Action

- Start slowly
- Increase intensity and duration gradually
- Find an exercise buddy
- Vary your program
- Expect fluctuations and lapses

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Exercise Guidelines for Special Health Concerns-1

- ✓**Check with your doctor before beginning;**
- ✓**Don't exercise alone;**
- ✓**Stress thorough warm-up & cool down!!**
- ✓***All things in moderation!!***

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Ch 3

Nutrition for Wellness

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Dietary Analysis

- Dietary analysis may be completed using the USDA **Food Tracker** program that is available on the WWW or from your home computer at:
- https://www.supertracker.usda.gov/foodtracker.aspx
- or **My Fitness Pal**
- http://www.myfitnesspal.com/
- or **Calories Per Hour** site
- http://www.caloriesperhour.com/index_food.html
- or **Dietary Approaches to Stop Hypertension** (**DASH**)
- http://dashdiet.org/default.asp

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Old Food Pyramid

Colors represent food groups & oils, widths of the bands offer a guide to portions

Figure represents the importance of daily physical activity

Red = Fruits 1 ½ - 2 cups/day

Yellow = Oils 5-7 TBLs/day

Orange = Grains 6 oz/day

Blue = Milk 3 cups/day

Green = Vegetables 2-3 cups/day

Purple = Meats & Beans 5 - 6 oz/day

https://www.choosemyplate.gov/supertracker/

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Replacement for Food Pyramid

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My Plate (Replaces the Food Pyramid)

Dairy

How Much? (@ 3 cups)

- Fruits
  - How Much? (@1.5 – 2 cups)
- Vegetables
  - How Much? (@2 – 3 cups) oz.)
- Exercise
  - How Much? (@2.5 hrs./week)

Grains — How Much? (@3 – 4 oz.)

Protein — How Much? (@5 – 6.5

MyPlate.gov
Dietary Guidelines

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Essential Nutrients

- Nutrients the body cannot produce in sufficient quantity for its needs
  - **Proteins -** (4 calories/gram) Form important parts of muscle, bone, blood, enzymes, repair tissue, regulate water balance & acid-base balance, help in growth, supply energy
  - **Fats** - (9 calories/gram) supply energy, insulate/ cushion organs, provide medium for absorption of fat-soluble vitamins
  - **Carbohydrates - (**4 calories/gram) supply energy to muscles and cells in brain, nervous system, & blood

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Essential Nutrients - **Continued**

- ***Non-energy providing***
- **Vitamins** – Promote specific chemical reactions within cells
- **Minerals** – Help regulate body functions; aid in growth & maintenance of body tissues; act as catalysts for the release of energy
- **Water** – Makes up 50% - 70% of body weight; provides a medium for chemical reactions; transports chemicals; regulates body temperature; removes waste products

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Sources of Energy

- Measured by number of kilocalories (calories)
- Average **male** requires around **2200-3500** calories per day (depending on activity level);
- Average f**emale** requires about **1600-2500** calories/day (depending on activity level)
- Excess calories stored by the body as fat
  - ✓ protein and carbohydrates provide 4 cal/gram
  - ✓ fats provide 9 cal/gram
  - ✓ alcohol provides 7 cal/gram

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Protein

- **12%-15%** of total calories should come from protein
- Important component of muscle, bone, blood, enzymes, cell membranes, hormones
- Amino acids (20) are building blocks of protein
- 9 are essential/required for normal health; 11 can be produced by the body if necessary ingredients are supplied by foods
- Sources: meat, fish, poultry, eggs, milk, cheese, legumes, nuts

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Protein - Continued

- "**Complete**" protein (i.e. meat, fish, poultry, milk, eggs, cheese) supplies all 9 essential amino acids;
- "**Incomplete**" protein (i.e. plant sources: legumes & nuts) usually low in 1-2 essential amino acids
- About 2/3 of protein intake comes from animal sources
- Most of us consume more than necessary
- Excess protein is synthesized into fat for energy

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Fats

- **25-30%** of total calories should come from fat
- Most concentrated source of energy
- Provide insulation and support for organs
- Help absorb fat-soluble vitamins
- 3 main types of fats from foods
  1) Saturated – animal flesh, whole milk, cheese, lunch meats, hot dogs - solid at room temperature
  2) Monounsaturated – olive, canola, safflower & peanut oils – liquid at room temp.
  3) Polyunsaturated – corn, soybean, & cottenseed oils – liquid at room temperature

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Fat Facts

- Fats make up 33% of average American diet
- Need only 1 tablespoon of vegetable oil (15 grams) to supply essential fats
- Saturated and trans fats raise blood levels of LDL ("bad" cholesterol)
- Unsaturated fats lower LDL and raise HDL ("good" cholesterol)
- Cholesterol Levels:
  - **Desirable - <200 mg/dl**
  - **Concern - 200 - 240 mg/dl**
  - **High - >240 mg/dl**

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Carbohydrates

- **@60%** of total calories should come from carbohydrates
- Supply energy to cells, especially during high-intensity exercise
- Simple carbohydrates (table sugar, honey, malt sugar, milk sugar) provide sweetness
- Found naturally in fruits & milk; added to fruit drinks, candy
- No evidence that one type of simple sugar is "better" than any other

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Carbohydrates – continued

- Complex carbohydrates (i.e. wheat, rye, rice, barley, potatoes, yams, legumes) provide starch and most dietary fiber
- Excess carbohydrates changed into fats and stored
- Unrefined carbohydrates (brown rice, whole wheat breads) are better than refined (white rice, white breads)
- Americans need to consume more unrefined complex carbohydrates

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Benefits of Unrefined Carbohydrates

1) Retain fiber, vitamins, minerals
2) Take longer to chew & enter blood stream more slowly
3) Slower digestive process makes you feel full sooner & longer
4) Lessens likelihood of overeating & gaining weight
5) Keeps blood sugar & insulin levels low – may decrease risk of diabetes

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Dietary Fiber

- Carbohydrate plant substances that are difficult or impossible for humans to digest
- Two types:
  1. "**soluble**" (dissolves in H_2O; lowers blood cholesterol; reduce risk of CV disease) and
  2. "**insoluble**" (binds H_2O; aids in elimination; can reduce risk of constipation, hemorrhoids, and diverticulitis – formation of abnormal pouches in walls of intestine that become inflamed)

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Dietary Fiber - Continued

- Contributes to disease prevention; prevents conditions arising in the intestinal tract; manage diabetes and high blood cholesterol
- Foods highest in dietary fiber: fruits, legumes, oats, barley, wheat bran, cereals, grains, and vegetables

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How to Increase Dietary Fiber

- ✓ Look for breads, crackers, etc. that list "whole grains" first on ingredient list (e.g. whole-wheat flour (**not** wheat flour), whole-grain oats)
- ✓ Eat whole, unpeeled fruit – rather than fruit juices
- ✓ Include beans in soups/salads; eat raw vegetables with pasta, rice
- ✓ Substitute bean dip for cheese dip or sour cream dips; use raw vegetables, **not** chips, for dipping

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Vitamins

♂ Vitamins - organic substances (carbon containing)

- ✓ Required in very small amounts to help chemical reactions in cells
- ✓ Release energy stored in carbs, fats, and proteins.
- ✓ Act as antioxidants by rendering free radicals harmless and preserving body's healthy cells
- ✓ Most must be obtained from foods
- ✓ Humans need 13 vitamins

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Vitamins

Fat-soluble (absorbed only in presence of fat) vitamins (4): require more complex digestive process; carried in blood by special proteins; stored in fat tissues rather than excreted

1) Vitamin A – Important for vision, skin, linings of nose, mouth, digestive & urinary tracts; immune function
2) Vitamin D – Important for bones & teeth, promotion of calcium absorption
3) Vitamin E – Protection & maintenance of cellular membranes
4) Vitamin K – Essential for blood clotting

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Vitamins - Continued

- Water soluble vitamins (9): absorbed directly into blood stream; excess excreted in urine

1. Vitamin C – Maintains/repairs connective tissue, bones, teeth, cartilage; promotes healing; aids in iron absorption
2. Thiamin - Converts carbohydrates into usable forms of energy; maintains appetite & nervous system functions
3. Riboflavin – energy metabolism, maintains skin, mucous membranes, & nervous system structures

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Vitamins - Continued

4. Niacin – Converts carbohydrates, fats, proteins into usable forms of energy
5. Vitamin B-6 – Protein & neurotransmitter metabolism; red blood cell synthesis
6. Folate – amino acid metabolism; synthesis of DNA; new cell synthesis
7. Vitamin B-12 – synthesis of red & white blood cells
8. Biotin – metabolism of fats, proteins, & carbohydrates
9. Pantohenic Acid - metabolism of fats, proteins, & carbohydrates

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Minerals

- Minerals - inorganic compounds (non-carbon containing)
  - ✓Help regulate body functions
  - ✓Needed in small amounts
  - ✓Regulate body functions
  - ✓Aid in growth
  - ✓Aid in tissue & cell maintenance
  - ✓Trigger release of energy
  - ✓17 essential minerals

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Minerals

- Most common missing: iron (anemia), calcium (osteoporosis), zinc (growth failure, poor wound healing), magnesium (neurological disturbances, CV problems, kidney disorders)
- Iron & zinc – available in lean meats; calcium is in low-fat or non-fat dairy products; magnesium is in green vegetables, grains; nuts

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Water

- Most important nutrient in food & human body
- Used in digestion & absorption of food
- Medium where most chemical reactions take place
- H_2O based fluids (blood) aid in transport of substances throughout body
- Serves as lubricants, cushions
- Helps to regulate body temperature
- Need at least 8 cups/day?; more if active or in hot environment

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Water

- Found in all tissues, blood, lymph and synovial fluids
- Found in almost all foods, especially liquids, fruit and vegetables
- 80 - 90% of daily water intake comes from eating & drinking
- Should drink before you are thirsty
- Thirst is body's first sign of dehydration
- Hydrate BEFORE an activity
- *Caffeinated beverages act as **diuretics**, increasing water output and raising the need for water??*
- Sugar & sodium require water to be dissolved, used, and excreted

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Other Substances in Food

- Antioxidants – Can help protect the body by blocking the formation & action of free radicals (implicated as factor in aging, cancer, CV disease)
- Phytochemicals – may help to prevent chronic disease. Soy products may help lower cholesterol; cruciferous vegetables (broccoli) may render cancer-causing compounds harmless; garlic & onions seem to boost cancer fighting cells

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Supplements?

- No substitute for a healthy diet
- Excess could lead to problems
- May lack the phytochemicals found in whole food
- More research needed regarding the potential disease-fighting properties (e.g. Vit. E)
- Large doses of some nutrients can effect the absorption of other vitamins & minerals

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Supplements?

- Pregnant women should have folic acid to reduce chance of birth defects
- People over 50 may need Vitamin B-12 – trouble absorbing the vitamin
- Women with heavy menstrual flow may need iron to prevent iron-deficiency anemia
- Newborns may need dose of Vitamin K
- If taken - look for a balanced formulation that contains 50%-100% of daily values

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Dietary Challenges

Vegetarians – Need to plan their diet to avoid problems – Need to eat wide variety of foods – may need to consult registered dietitian

Women – Smaller/weigh less/eat less – may miss essential nutrients (iron & calcium)

Men – tend to overeat meat and need more fruits, vegetables, grains in their diet

College Students – eat on the run; make poor choices

Older Adults – less active, need fewer calories, need fiber in diet

Athletes – need fluids, carbohydrates for energy, protein for muscle development, careful of "special" supplements

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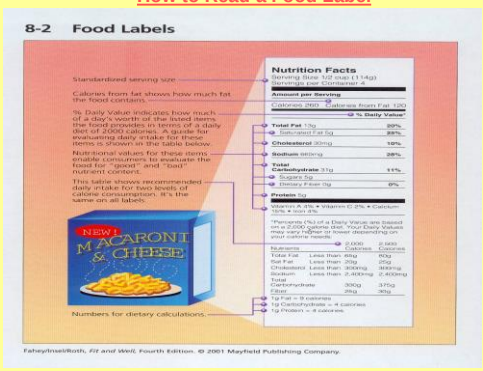
How to Read a Food Label



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Servings

The 5-20 Rule

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Ch 4

Body Composition Assessment

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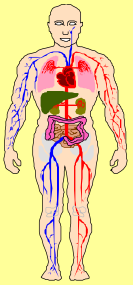
Benefits of Healthy Body Composition



- Better health
- Improved performance of physical activities
- Better self-image

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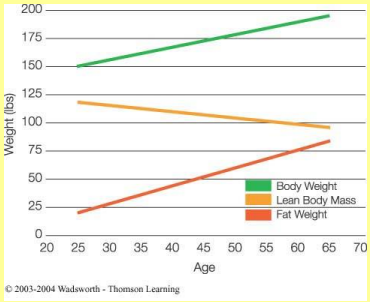

Figure 4.7 Typical body composition changes for adults in the United States.

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Body Composition
Proportionate amounts of fat tissue and nonfat tissue in the body.

% Body Fat
Adipose tissue as a percent of total body tissue.

Lean Body Mass
Nonfat tissue made up of muscle, bone, and organs (heart, brain, liver, kidneys).

Essential Fat
Body fat needed for normal physiological functioning.

Storage Fat
Fat found beneath the skin and around major organs that acts as an insulator, as padding, and as a source of energy.

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Body Composition

- Fat-free mass (Lean Weight)
  - all the body's nonfat tissues
  - bone, water, muscle, connective tissue, organ tissues, teeth
- Fat
  - essential fat (needed for body function)
    - found in nerves, brain, heart, lungs, liver, mammary glands
    - makes up 3% of total body weight in males
    - makes up 12% of total body weight in females
  - nonessential (storage) fat (excess body fat)
    - found in adipose tissue

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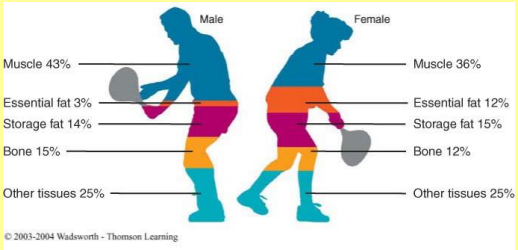

Figure 4.1 Typical body composition of an adult man and woman.

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Overweight and Obesity - Basics

- Overweight: body weight in relation to one's height and frame size (@66% of population)
- Overfat: Actual percentage of body mass made up of adipose tissue. Health may be compromised. Can't be measured with height/weight charts
- Obesity: more serious degree of overweight based on percent body fat (♂ ≥ 25% and ♀ ≥32%
  - @ 30.5% of population)
- Percent body fat (proportion of body's total weight that is fat) is a more accurate measurement of body composition than total body weight

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Percent Body Fat Classifications

Classification	Male	Female
Unhealthy range	≤ 5%	≤ 8%
Acceptable range (**lower end**)	6-15%	9-23%
Acceptable range (**higher end**)	16-24%	24-31%
Unhealthy range	≥ 25%	≥ 32%

Source: Neiman, D.C. (2003) *Exercise Testing and Prescription: A Health Related Approach* (5th ed.). New York: McGraw Hill.

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Body Composition in the United States

- Sedentary lifestyles are on the increase
- Average caloric intake has increased by 100-300 calories/day in last 10 years
- Potential increase in negative health effects:
  - Hypertension (risk is doubled if obese),
  - Elevated cholesterol levels (risk ratio is higher in obese)
  - Diabetes (obese rate is three times higher than non-obese),
  - Certain types of cancers:
    ♂ = colon, rectum, prostate;
    ♀ = gallbladder, uterus, cervix, ovaries

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Body Composition in the United States

- Distribution of body fat is also important
- Gaining of weight in abdominal area has higher risk of coronary heart disease, high BP, diabetes, and stroke than gaining weight in hip area.
- Problems can also arise if individuals have too little body fat (eating disorders)
  - ≤ 8% for women and ≤ 5% for men

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Assessing Body Composition

- Body Mass Index (BMI)
  - **Not** a measure of body composition
  - ✓ One's weight should be proportional to height
  - ✓ Body composition or fat distribution are not considered!
  - ✓ calculated by dividing weight (kg) by height (meters)^2 *or*
  - ✓ by dividing weight (lbs) by height (inches)^2 x 705

BMI = 170lbs/[72"]^2 x 705 = 23

http://www.mayoclinic.org/bmi-calculator/itt-20084938

- **If your BMI is less than 18.5**, it falls within the "underweight" range.
- **If your BMI is 18.5 to 24.9**, it falls within the "normal" or Healthy Weight range.
- **If your BMI is 25.0 to 29.9**, it falls within the "overweight" range.
- **If your BMI is 30.0 or higher**, it falls within the "obese" range.

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Assessing Body Composition

- Percent body fat
  - ✓ calculated using skinfold measurements (± 3% error)
  - ✓ ♂ = Chest, Abdomen, Thigh; ♀ = Triceps, Suprailium, Thigh
- Other methods
  - ✓ Hydrostatic (underwater) weighing (± 2.5% error – H_20 displacement)
  - ✓ Bioelectrical impedance analysis (BIA) (± 10% error – tends to overestimate body fat in very lean individuals and underestimate body fat in obese)
  - ✓ Air Displacement Plethysmography - Air displacement (Bod Pod) (± 2.2% error – better accuracy needed for different populations (age-groups, ethnic groups, and athletic groups)
  - ✓ Dual Energy X-Ray Absorptiometry (DEXA) – uses x-ray energy to assess body composition (± 1.8% error)

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Percent Body Fat Table

Population	Male	Female
	Age < 20	Age < 20
Minimum	4%	9%
Endurance Trained	4%-8%	8%-15%
Healthy, Untrained	12%	22%
(Range)	12%-22%	20%-26%
	Add 1% per 10 years of Aging	
Overfat	≥ 25%	≥ 32%

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Estimates of Ideal Body Fat for Different Age Groups			
Age Group		Average % Fat	Ideal % Fat
18-24	Male	12	10
	Female	22	18
25-30	Male	15	10
	Female	25	18
31-40	Male	17	12
	Female	27	20
41-50	Male	20	15
	Female	30	23
51-60	Male	24	17
	Female	34	25

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Measuring Body Fat Distribution

1) * Waist circumference measurement
   Problem if: ♂ > 40 in; ♀ > 35 in.

2) Waist-to-hip-circumference ratio
   Definition: waist circumference measurement divided by the measurement of the widest circumference around the hips.

3) Results that exceed norms are associated with significant health risks (e.g. Type 2 diabetes, hypertension, cardiovascular disease)

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Achieving Healthy Body Weight and Composition

- Set an overall goal and realistic intermediate goals
- Calculate a target body weight or percent body fat
- Increase level of activity
- Follow a healthy diet
- Track progress

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Body Composition Considerations

- Body weight measurements do not reveal actual changes in body fat or muscle levels.
- Muscle weighs more than fat and burns more calories at rest.
- Exercise can increase muscle and decrease body fat.
- Dieting can decrease precious muscle in our bodies.

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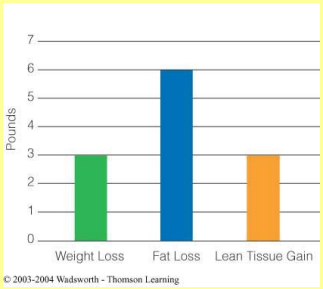
Effects of a 6-week Aerobics Exercise Program on Body Composition



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Body Composition Questions

- What about spot reducing?
- Need to reduce overall amounts of fat by burning more calories than you take in.
- What is cellulite?
- Cellulite is fat deposited under the skin
- Best removed with diet & exercise program
- Liposuction?
- Surgical removal of fat in specific areas.
- Can be risky solution to problem.

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