

- Chapter 19
- Coronary Heart Disease and Hypertension
- Chapter 19
  - Lesson 19.1
- Key Concepts
- Cardiovascular disease is a leading cause of death in the United States.
- Several risk factors contribute to the development of cardiovascular disease and hypertension, many of which are preventable by improved food habits and lifestyle factors.
- Key Concepts, cont'd
- Other risk factors are nonmodifiable, such as age, gender, family history, and race.
- Coronary Heart Disease
- Atherosclerosis
- Acute cardiovascular disease
- Chronic heart disease
- Atherosclerosis
- Disease process
  - Fatty fibrous plaques develop into fatty streaks on inside lining of major blood vessels
    - Fatty streaks largely composed of cholesterol
    - Thickens, narrowing the interior part of the blood vessel
  - If affected vessel is major artery supplying heart muscle, result could be myocardial infarction

- Local area of dead tissue is an infarct
- Atherosclerosis, cont'd
- Disease process, cont'd
  - If affected vessel is major artery supplying brain, result could be cerebrovascular accident
    - Common name, “stroke”
- Atherosclerosis, cont'd
- Disease process, cont'd
  - Identified as coronary heart disease
  - Common symptom is angina pectoris, chest pain usually radiating down the arm, sometimes brought on by excitement or physical effort
- Atherosclerosis, cont'd
- Disease process, cont'd
  - Key terms related to Atherosclerosis:
    - Myocardial infarction
    - Cerebrovascular accident
    - Coronary heart disease
    - Angina pectoris
    - Lipids
- Atherosclerotic Plaque in Artery
- Atherosclerosis: Relation to Fat Metabolism
- Elevated blood lipids associated with coronary heart disease

- Triglycerides: Simple fats in body or food
- Cholesterol: Fat-related compound produced in body; also in foods from animals
- Lipoproteins: “Packages” wrapped with protein that carry fat in the bloodstream
- Atherosclerosis:  
Types of Lipoproteins
- Very-low-density lipoproteins (VLDLs)
  - Carry large load of fat to cells
- Low-density lipoproteins (LDLs)
  - Carry two thirds of total plasma cholesterol to body tissues
- High-density lipoproteins (HDLs)
  - Carry less total fat and more protein
- Cholesterol and Lipoprotein Profile Classification
- Risk Factors in Cardiovascular Disease
- Lipid risk factors
  - LDL cholesterol >130 mg/dl
  - HDL cholesterol <40 mg/dl
  - Total cholesterol >200 mg/dl
  - Triglycerides >150 mg/dl
  - Atherogenic dyslipidemia

- Risk Factors in Cardiovascular Disease, cont'd

- Nonlipid risk factors

- Nonmodifiable

- Male gender
    - Age (men >45 years, women >55 years)
    - Heredity (including race)
    - Family history of premature cardiovascular disease

- Risk Factors in Cardiovascular Disease, cont'd

- Nonlipid risk factors, cont'd

- Modifiable

- Cigarette smoking
    - Hypertension (>140/90 mm Hg or on antihypertensive medication)
    - Physical inactivity
    - Obesity (body mass index >30 kg/m<sup>2</sup>) and overweight (body mass index 25 to 29.9 kg/m<sup>2</sup>)
    - Diabetes mellitus
    - Metabolic syndrome
    - Atherogenic diet

- Risk Factors in Cardiovascular Disease, cont'd

- Emerging risk factors

- Emerging lipid risk factors

- Elevated lipoprotein remnants
    - Elevated lipoprotein(a)
    - Small LDL particles
    - Elevated apolipoprotein B

- Low apolipoprotein A1
  - High total cholesterol/HDL cholesterol ratio
- Risk Factors in Cardiovascular Disease, cont'd
- Emerging risk factors, cont'd
  - Emerging nonlipid risk factors
    - Hyperhomocysteinemia
    - Thrombogenic and hemostatic factors
    - Inflammatory markers such as C-reactive protein
    - Impaired fasting glucose
- Diagnosing Metabolic Syndrome
- Dietary Recommendations for Reduced Risk
- Dietary Guidelines for Americans, 2005
  - Reduce total amount of fat: no more than 30% of total energy (kilocalories) intake from fat
  - Reduce use of animal fat: no more than one third of total fat kilocalories from saturated animal fat
  - Reduce intake of cholesterol: limit to 300 mg/day
- Dietary Recommendations for Reduced Risk, cont'd
- National Cholesterol Education Program Guidelines
  - Energy intake should reflect energy expenditure
  - Total fat intake no more than 25% to 35% of total kilocalories
  - Carbohydrates comprise 50% to 60% of total energy intake per day

- Total protein intake should be 15% of total energy intake
  - Less than 200 mg dietary cholesterol per day
- American Heart Association and NCEP Recommendations for Lowering Cholesterol
- ATP III LDL Cholesterol Goals and Cut Points for TLC and Drug Therapy
- Acute Cardiovascular Disease
- Objective: Cardiac rest
- Principles of diet therapy
  - Energy intake
  - Texture
  - Fat
  - Sodium (2 to 4 g/day)
- Chronic Heart Disease
- Objective: Control of pulmonary edema
  - Fluid shift mechanism
  - Hormonal alterations
- Principles of diet therapy
  - Sodium restriction
  - Fluid restriction
  - Texture
  - Small meals
  - Alcohol
- Chapter 19

- Key Concepts
- Hypertension, or chronically elevated pressure, may be classified as essential (primary) or secondary.
- Hypertension damages the endothelium of blood vessels.
- Key Concepts, cont'd
- Early education is critical for the prevention of cardiovascular disease.
- Essential Hypertension
- Incidence and nature
  - 23% of American adults have high blood pressure (hypertension)
  - Injury to inner lining of blood vessel wall appears to be underlying link to cause
  - Secondary hypertension is symptom or side effect of another primary condition
  - Hypertension called the “silent disease”
- Types of Hypertensive Blood Pressure Levels
- Prehypertension
  - Focus on lifestyle modifications
- Stage 1 hypertension
  - Diet therapy and drugs as needed
- Stage 2 hypertension
  - Diet therapy and vigorous drug therapy
- Drug-Nutrient Interaction

- The grapefruit conundrum
  - Calcium channel blockers
    - Gastrointestinal complaints such as constipation and nausea
    - Headache
    - Flushing
    - Bradycardia or reflex tachycardia
    - Skin rash
- Drug-Nutrient Interaction, cont'd
- The grapefruit conundrum, cont'd
  - HMG-CoA reductase Inhibitors
    - Gastrointestinal complaints such as constipation, diarrhea, stomach pain, heartburn, gas
    - Headache
    - Muscle pain
    - Increased risk of myopathy
    - Skin rash
- Classification of Blood Pressure for Adults
- Principles of Nutrition Therapy
- Weight management: Lose weight and maintain appropriate weight for height
- Sodium control
- Other minerals: Calcium, magnesium
- DASH diet: Lower blood pressure through diet alone
- Additional lifestyle factors



- Education and Prevention  
Practical Food Guides
- Food planning and purchasing
  - Control energy intake; read labels
  - Eat fresh foods with small selection of processed foods
- Food preparation
  - Use less salt and fat
  - Use seasonings instead (herbs, spices, lemon, onion, garlic, etc.)
- Special needs
- Education Principles
- Start early
  - Prevention begins in childhood, especially with children in high-risk families
- Focus on high-risk groups
  - Direct education to people and families with risk of heart disease and hypertension
- Use variety of resources
  - National organizations, community programs, registered dietitians
- Summary
- Coronary heart disease is the leading cause of death in the United States. Its underlying blood vessel disease is atherosclerosis.
- The risk for atherosclerosis increases with the amount and type of blood lipids (fats), or lipoproteins, available. Elevated serum cholesterol is a primary risk factor for development of atherosclerosis.
- Summary, cont'd

- **Current recommendations to help prevent coronary heart disease involve a low-fat balanced diet, weight management, and increased physical activity.**
- **Dietary recommendations for acute cardiovascular disease (e.g., heart attack) include measures to ensure cardiac rest (e.g., energy restriction, and small meals, modified in fat, cholesterol, and sodium).**
- **Summary, cont'd**
- **Persons with chronic heart disease involving congestive heart failure benefit from a low-sodium diet to control pulmonary edema.**
- **Persons with hypertension may improve their condition with weight control, exercise, sodium restriction, and adequate calcium and potassium intake.**