Chapter 16

Human Anatomy
Each System we will examine:

• Structures
  • types
• Problems or health concerns
• How to care for that system
Skeletal System

• Made up of
  • bones,
  • joints,
  • connective tissue

Is the frame for your body and muscles to attach to
206 bones in the body!
Bones are living structures:
storage of minerals: calcium and phosphorus
Bones: where red blood cells are produced.
Marrow is the soft tissue in the center of some bones
Joints

• Hinge Joints:
  • movement in one direction

• Gliding Joints:
  • bones that slide over one another

• Pivot Joints:
  • movement with limited rotation

• Ball and socket joints:
  • these joints allow complete rotation.
Connective Tissues

• Cartilage: strong flexible, gel-like tissue that cushions your joints.

• Tendons: muscles to bones

• Ligaments: bones to bones (in joints)
Problems in the Skeletal System

• Fracture:
  break in the bone
Dislocation

- Bone is pushed out of its joint
- Usually stretching or tearing a ligament

Shoulder Dislocation

Normal anatomy
Anterior dislocation
Posterior dislocation
Stretching or twisting ligaments

Ankle sprain

Damage to ligaments of the ankle

Grade I: Ligaments stretched or slightly torn
Grade II: Ligaments partially torn
Grade III: Ligaments completely torn

Swelling, inflammation, and bruising of ankle
Causes of over-use injuries

- Poor level of general fitness
- Poor level of flexibility
- Sudden increase in activity
- Inappropriate or unsuitable equipment
- Incorrect technique while performing an activity
Scoliosis

• Spine curves in an S or C shape
Caring for your Skeletal System

• Can only add bone mass while in you are still growing
• Good Nutrition: Calcium, phosphorus, magnesium, vitamin D.
  • Regular activity increases bone mass
• If you are injured take time to heal all the way.
Muscular System

• Group of structures that give you body parts the power to move
Skeletal Muscle

• make up most the muscular system. They are voluntary.
  • More than 600 in the body
Smooth Muscles

• found in organs, blood vessels, and glands
  • mouth, stomach, and lungs
Cardiac Muscles

• found only in the wall of your heart
How muscles work

• Often in pairs, when one muscle contracts, one muscle extends
Problems of muscular system

- Soreness
- Muscular Dystrophy
Care of muscular system

• Use your muscles! Be mindful of amount of rest needed to!
• Eat healthy
• Lift properly: with your legs
Circulatory System

- Group of organs and tissues that move essential supplies to the body cells and remove their waste products.
• Cell Respiration: process in which the body’s cells are nourished and energized.
• Blood flows and picks up nutrients from digestive system and oxygen from lungs.
• Cells use nutrients for energy.
• Cells dump waste at liver and kidneys and lungs for removal.
Blood

• Platelets solid parts of the blood
  • Help with blood clotting
• Plasma liquid parts of the blood
• Red Blood cells carry O2 to the cells and carbon dioxide away from them
• White Blood Cells carry germ fighters of the body that need them
Blood Vessels

• Arteries: carry oxygen rich blood away from the heart
• Veins Carry carbon dioxide rich blood back to the heart
• Capillaries the connections between Arteries and Veins
Problems:

- **Hypertension**: high blood pressure, leads to kidney failure, heart attack or stroke
- **Heart Attack**: is the blockage of blood flow to the heart
- **Stroke**: usually results from blood clots that block vessels in the brain or rupture of a blood vessel
- **Arteriosclerosis**: condition in which arteries harden reducing blood flow
- **Anemia**: low level of hemoglobin, protein that binds to oxygen in RBC
- **Leukemia**: cancer in which large amounts of abnormal white blood cells are produced that interferes with the production of other BC
Caring for your Circulatory System

• PHYSICAL ACTIVITY! 60 Minutes Every Day
• Limit the amount of fat you eat
• Avoid tobacco, alcohol and drugs
Respiratory System

Organs that supply the body with constant oxygen and rid the body of carbon dioxide

Respiration: exchange of gases between your body and the air
  External: between blood and air in the lungs
  Internal: between the blood and the cells in the body
Structures

• See figure 16.5
• Pg 419
• How the diaphragm works
Problems

• Asthma
Caring for the Respiratory System

Physical Activity increases lung strength
Avoid tobacco and polluted air
Nervous System

• Bodies Message Center
• Central Nervous System: includes brain and spinal cord
• Peripheral nervous system: nerves that connect to the central nervous system and all parts of the body
• Neurons: specialized nerve cells that send and receive transmissions
Part of the brain:

• Cerebrum: controls senses, movement of muscles, thinking and speech
• Cerebellum: balance posture and coordination
• Brain stem: automatic body functions,
• Meninges: membranes that cover the brain and spinal cord.
Problems

• Meningitis: infections of the meninges
• Brain Tumor: abnormal growth of tissue that kills normal neurons around it
• Epilepsy: Small parts of the brain is damaged causing seizures
• Addictions
Protection

• Be Physically Active
• Wear protective gear
• Wear seatbelt
• Avoid Alcohol, and other drugs
• Caffeine and sugar also effects the brain!
The Excretory System

• Your body’s waste removal system
• Excretion: the process of removing wastes from the body
• Food Particles that cannot be digested move from the small intestine to the large intestine
• The colon is another name for the large intestine.
• Other liquid wastes are sent to the kidneys:
  • Kidneys: filter water and dissolved wastes from the blood and help maintain proper levels of water and salts in the body.
Problems

• Gallstones and Kidney stones: painful blockages caused by mineral crystals.
• Appendicitis: inflammation of the appendix
• Hemorrhoids: masses of swollen veins at the opening of the butt.
Care of the Excretory System

• Eat variety of healthful foods
• Take your time when eating
• Drink plenty of water
• Wash hands regularity.
Endocrine System

• Is a chemical communication system that controls many body functions.

• Some major glands include:
  • Adrenals, parathyroid, pineal body, pituitary, thyroid

• Pituitary gland: is the gland that signals other endocrine glands to produce hormones when needed.
Hormones:

- The chemicals secreted by the endocrine glands
- They help regulate body functions:
  - Adrenaline: increases health rate and blood pressure when the body experiences stress
  - Pineal body: secretes melatonin to regulate the sleep cycle
Endocrine System Problems:

• Type 1 diabetes occurs when the pancreases cannot produce enough insulin.

• Type 2 diabetes occurs when the body cannot use the insulin it produces properly.
  • This usually occurs in people who are overweight and who do not get enough physical activity.
Care of the Endocrine System:

• Practice good health habits:
  • Eat a balanced diet
  • Sleep 8-10 hours a night
  • 60 min of activity daily
  • Less/no daily stress