





The Muscular System

Chapter 15 Lesson 3



Functions of the Muscular System

- Moving bones 
- Pumping blood 
- Moving food through the digestive system 
- Controlling air movement in and out of the lungs 

Structure of the Muscular System

- A muscle consists of a mass of fibers grouped together.
- Muscle growth is an increase in size, not the number of muscle fibers.



Muscle cell


Types of Muscles

- Smooth Muscle
- Skeletal Muscle
- Cardiac Muscle




Smooth Muscle



- Act on the lining of passageways and internal organs
- Unstriated muscle 
- Located in the intestines, blood vessels & passageways to the lungs
- Involuntary – person does not activate – works automatically

Human Jejunum

Skeletal Muscle

- Attached to bone and causes movement 
- Voluntary – person activates movement
- Account for about 40% of body weight
- Are striated → striped appearance under a microscope



Tongue

- Work in pairs – one contracts, other extends

Skeletal Muscle Contraction

- The shortening of a muscle
- Flexors – muscles that bend a limb at a joint
- Triggered by nerve impulses
 - impulses travel from the spinal cord to the muscle being used through nerves
 - nerves break into nerve endings in the muscle
 - nerve endings stimulate muscle fibers by contact to motor end plates



Skeletal Muscle Extension

- Stretching of a muscle
- Extensors – Muscles that straighten a limb



- If flexors & extensors work at the same time → work against each other = no movement

Muscle Tone

- Is the natural tension in the fibers of a muscle
- Muscle fibers contract causing muscle tone or firmness
- Aging and poor health causes muscles to lose their tone = little or no impulses from nerves
- Good health = a constant flow of impulses from nerves → muscle tone
- Tone is important for posture
- Exercise and good nutrition help muscle tone

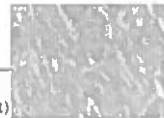


Cardiac Muscle

- Type of striated muscle that forms the walls of the heart
- Responsible for contraction of the heart → pumps blood through your cardiovascular system
- Heart contracts about 100,000 times each day
- Involuntary – person does not activate – works automatically



Myocardium
(wall of the heart)



Care for the Muscles

- Regular physical activity with stretching, warm-up, and cool down
- Practice good posture for health of back muscles
- Aerobic exercise to help your cardiac muscles
- Healthy diet
- Muscles that remain unused for long periods of time will atrophy, decrease in size & strength



Problems of the Muscular System

- Muscle strain, or pulled muscle, is a sudden, painful stretching or tearing of muscle fibers
 - Treatment – P.R.I.C.E. (protection, rest, ice, compression, elevation)
- Sprain – injury to the ligament in a joint



Problems of the Muscular System



- Tendonitis – inflammation of a tendon
 - Can be caused by injury, overuse, or aging
 - Symptoms – joint pain or swelling
 - Treatment – rest, anti-inflammatory medication, or ultrasound
- Hernia – when an organ or tissue protrudes through an area of weak muscle
 - Can be caused from straining to lift a heavy object
 - Treatment - surgery

Infant abdominal hernia (gastroschisis)



Problems of the Muscular System



- Muscular Dystrophy – a inherited, crippling disease characterized by a progressive wasting away of skeletal muscles
 - muscle is replaced with fatty tissue
 - early detection is important to postpone muscle weakening
 - no cure, but exercise can maintain some flexibility



Problems of the Muscular System



- Muscle cramp – muscle contracts spasmodically and involuntary – feels tense and painful – may occur from using muscles for too long, overworking in the heat
 - Treatment: stretch and massage the muscle, heat can help the muscle relax

Problems of the Muscular System



- Myasthenia Gravis – a disease that is characterized by muscles that are weak and easily fatigued
 - most affected are the eye muscles = drooping eyelids and double vision
 - mostly affects women of childbearing age, during pregnancy or following an infection
 - symptoms can be treated with medicines



