

Muscular System

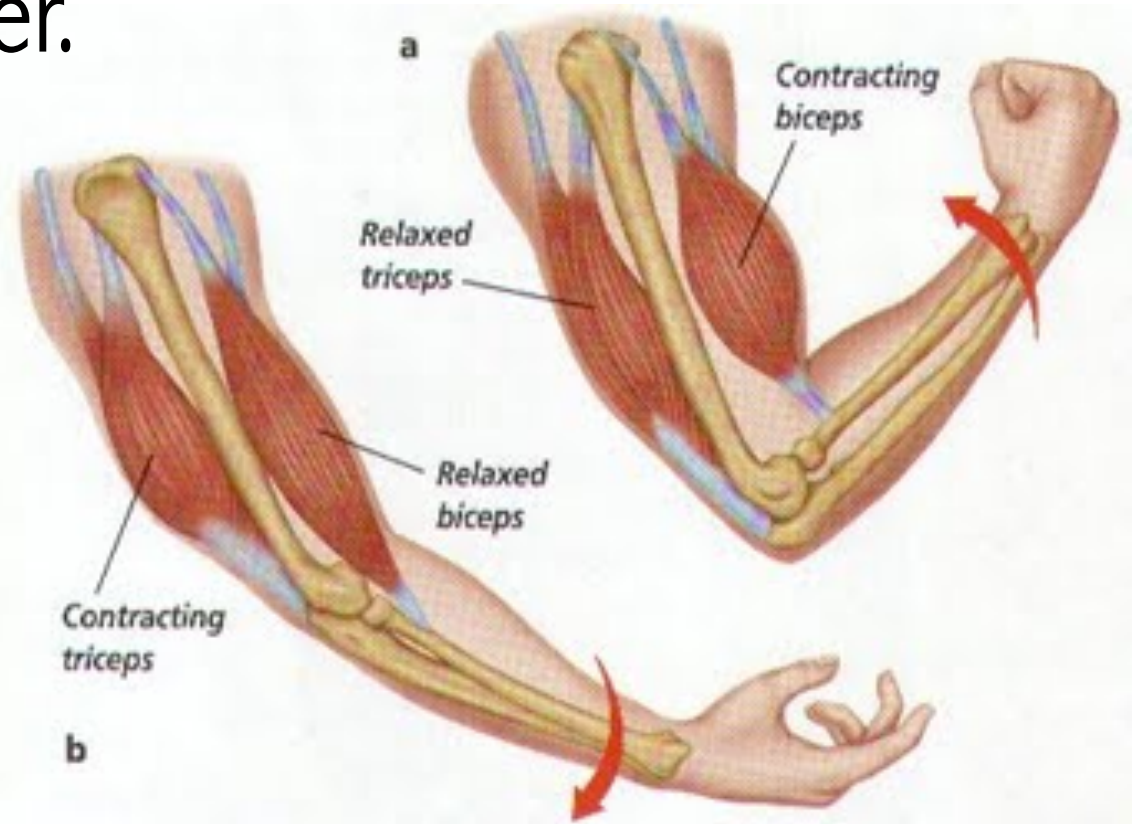
Muscular System

- A muscle is made of strong tissue that can contract in an orderly way.
- Your muscular system is made of different types of muscles and has several functions.



Muscular System

- All muscle tissues are made of cells that contract.
- When the cells of a muscle contract, the muscle tissues become shorter.
- The muscle tissues return to their original length when the cells relax.



Functions

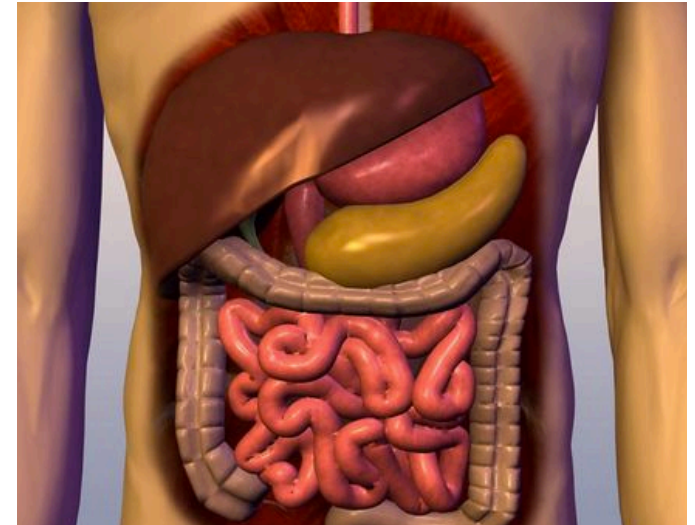
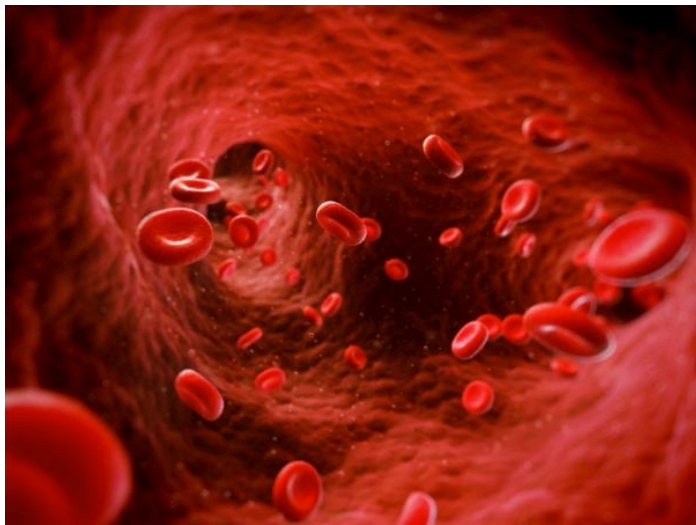
Movement

- Many of your muscles help you move. Most of these muscles attach to bones. These muscles make your skeleton move.
- When muscles contract, they move bones. This movement can be fast, such as when you run. The movement can also be slow, such as when you stretch.

Functions

Movement

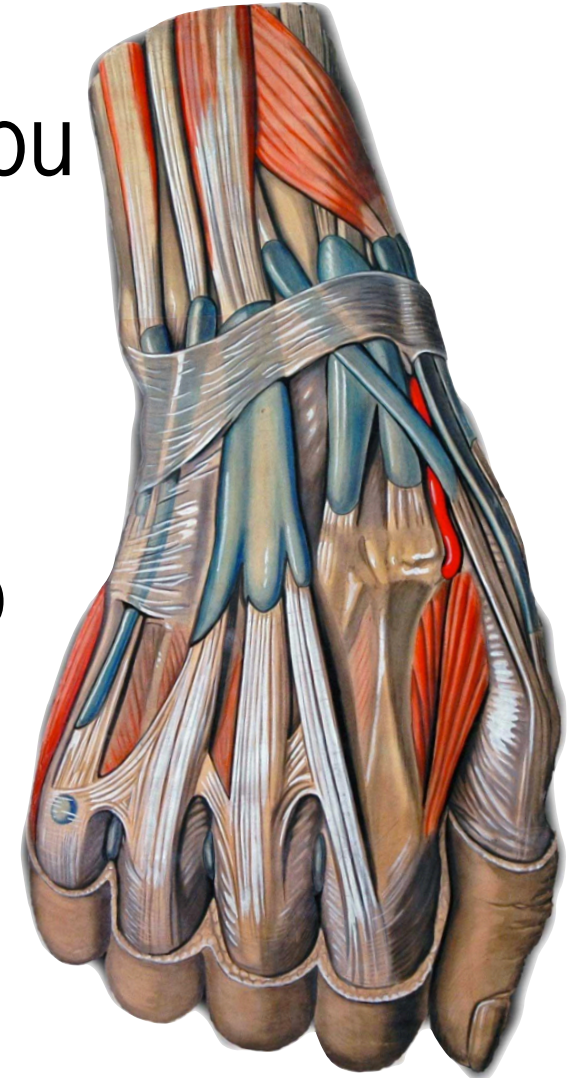
- You have many muscles in your body that are not attached to bones.



Functions

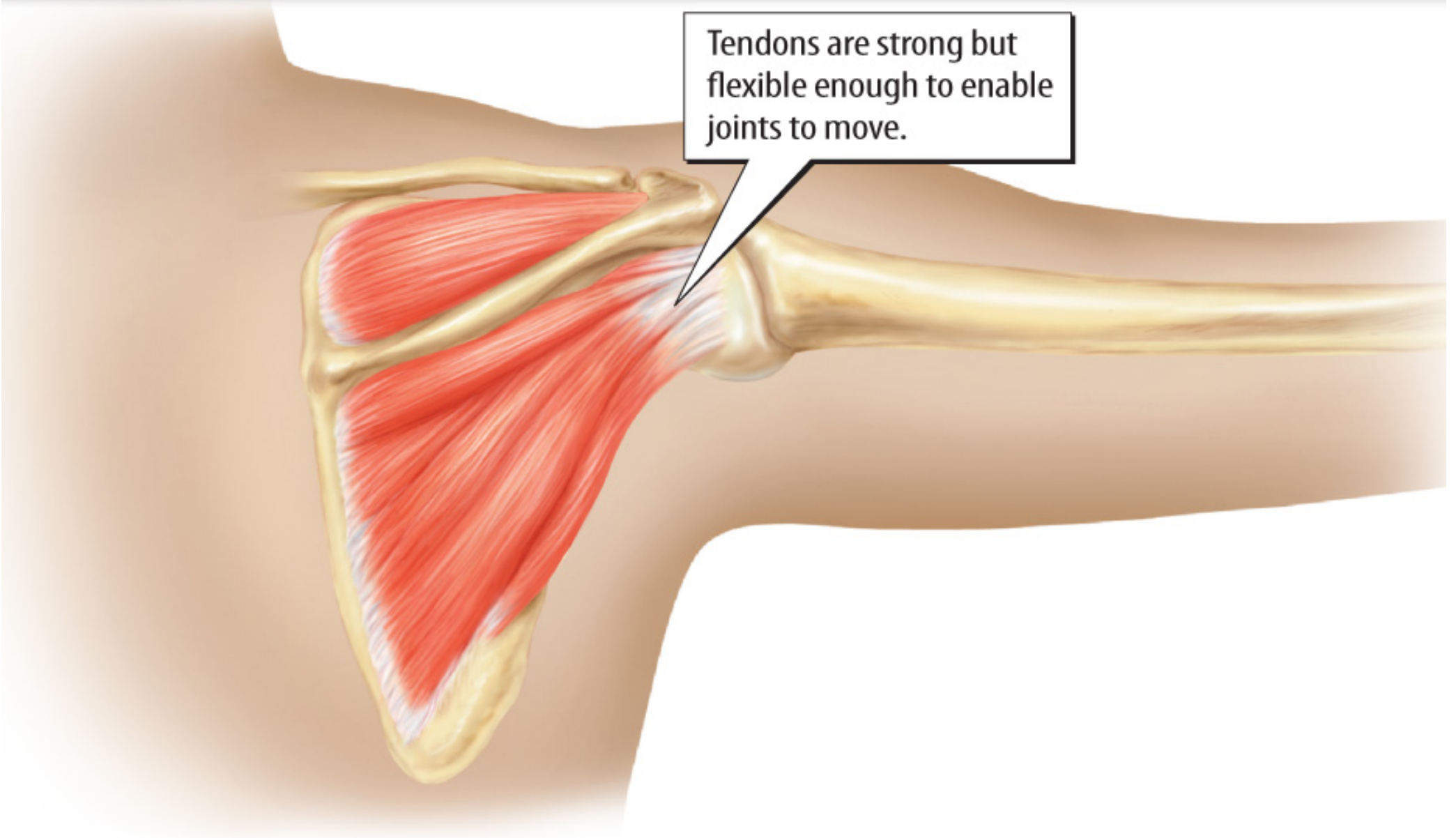
Stability

- Muscles that are attached to your bones support your body and help you keep your balance.
- Tendons attach muscles to bones.
- Tendons work with muscles and keep your joints in place when your body moves.
- Tendons also help hold your body in a correct posture, or shape.



Functions

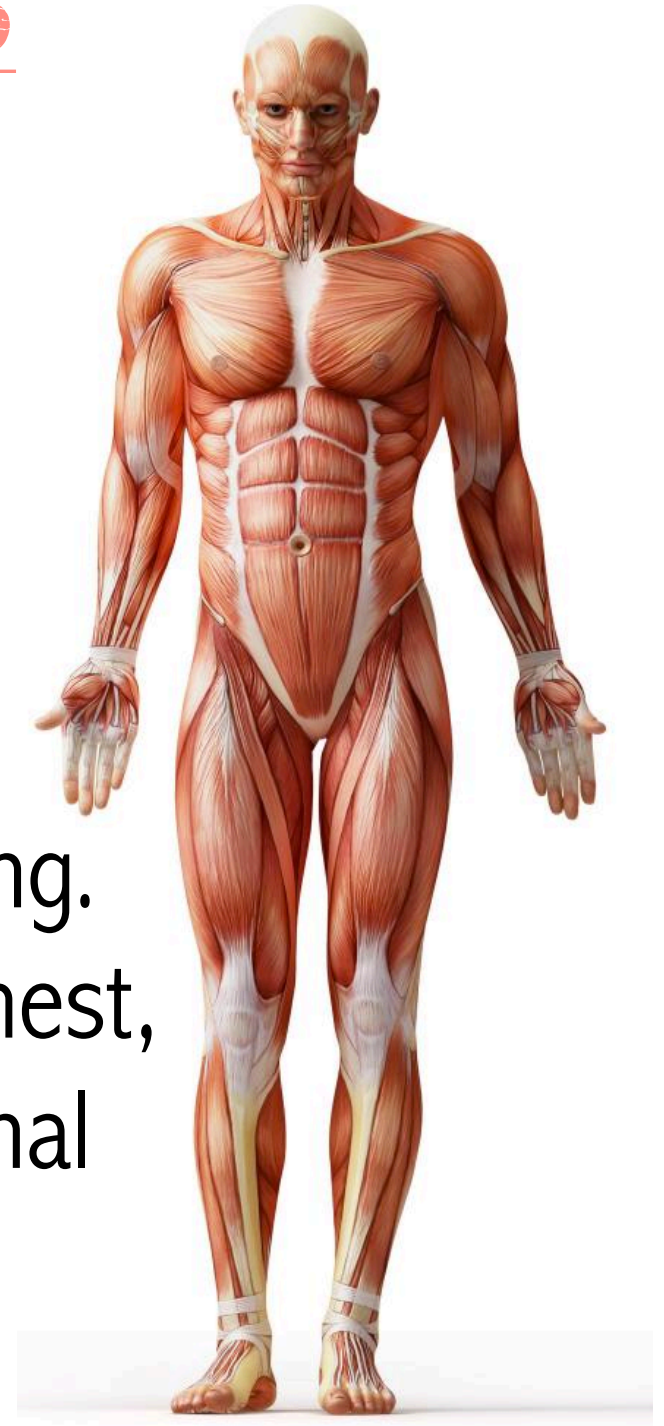
Tendons are strong but flexible enough to enable joints to move.



Functions

Protection

- Muscles protect your body. They cover most of your skeleton.
- Muscles also cover most of the organs inside your body.
- Muscles are like a layer of padding. They surround your abdomen, chest, and back, and protect your internal organs.



Functions

Temperature Regulation

- Your muscular system helps your body keep your internal temperature within a certain range.
- Have you ever felt cold and then started shivering?
- Shivering is muscles rapidly contracting. This changes chemical energy to thermal energy. The released thermal energy helps maintain your body's temperature.



Functions

Temperature Regulation

- This is important because a human's body temperature must stay around 37°C in order for the body to function properly.



- Muscles also change chemical energy to thermal energy during exercise. This is why you feel warm after physical activity.

Types of Muscles

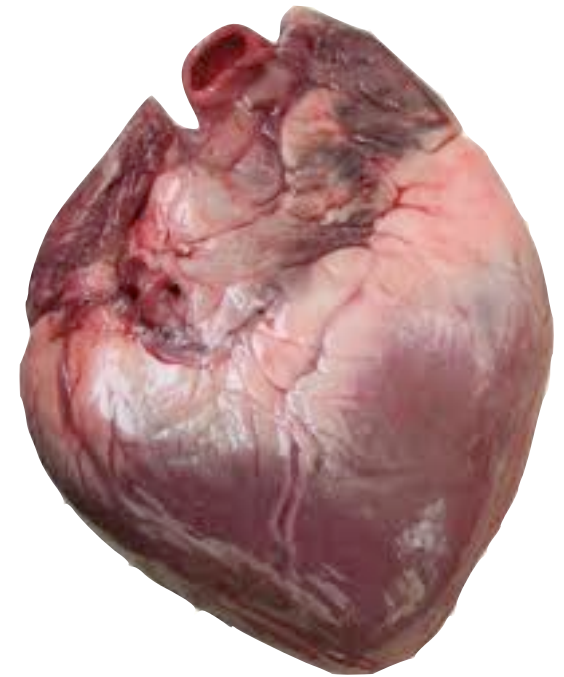
- Your body has three different types of muscles:



skeletal



smooth



cardiac

Types of Muscles

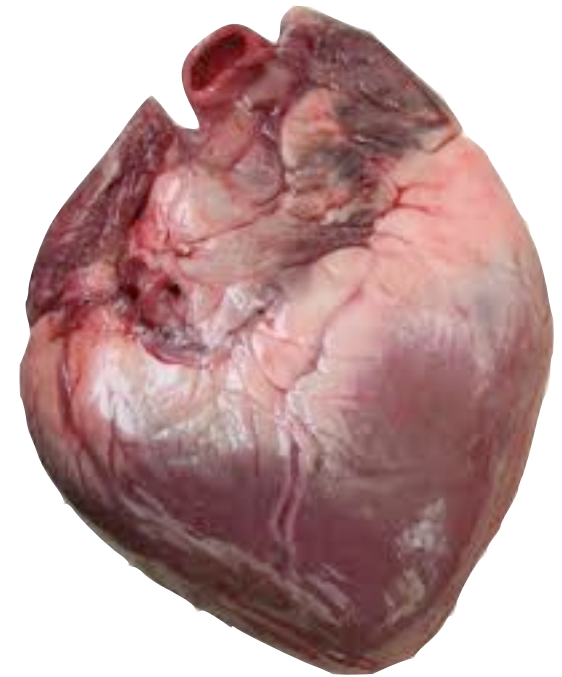
- Each type of muscle is specialized for a different function.



skeletal



smooth



cardiac

Types of Muscles

skeletal

- Muscle that attaches to bones is skeletal muscle.
- Skeletal muscles are also called voluntary muscles.
- Voluntary muscles are muscles that you can consciously control.



Types of Muscles

skeletal

- For example, you can control whether or not you lift your leg. The contractions of skeletal muscles can be quick and powerful, such as when you run. However, contracting these muscles for a long time can tire them or make them cramp.



Types of Muscles

skeletal

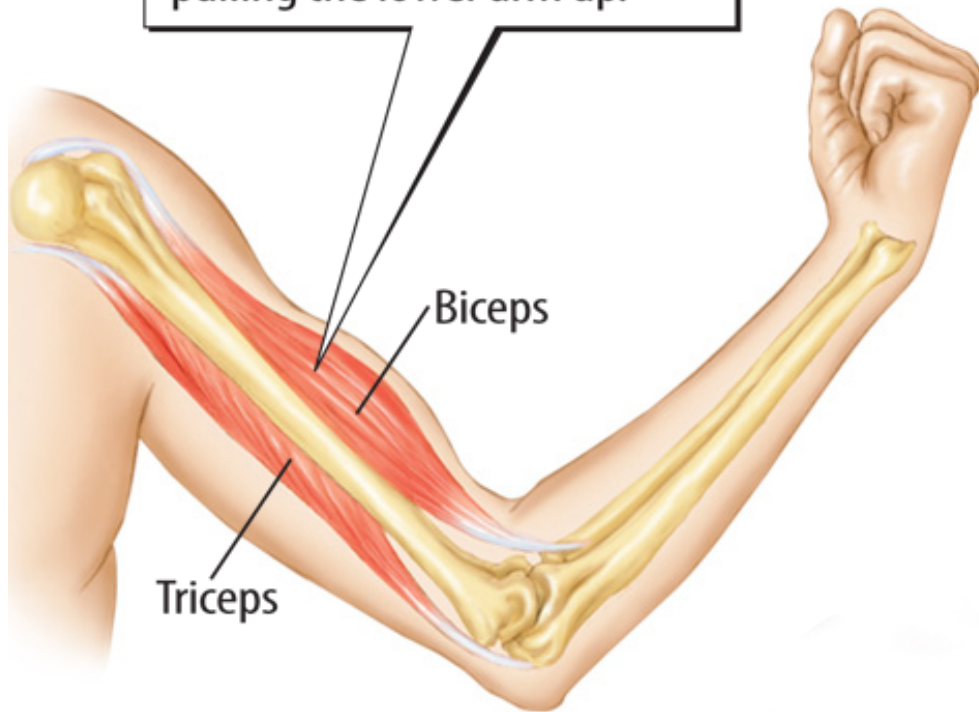
- Skeletal muscles work by pulling on bones.
- Muscles cannot push on bones. Instead, muscles work in pairs and move the body.



Types of Muscles

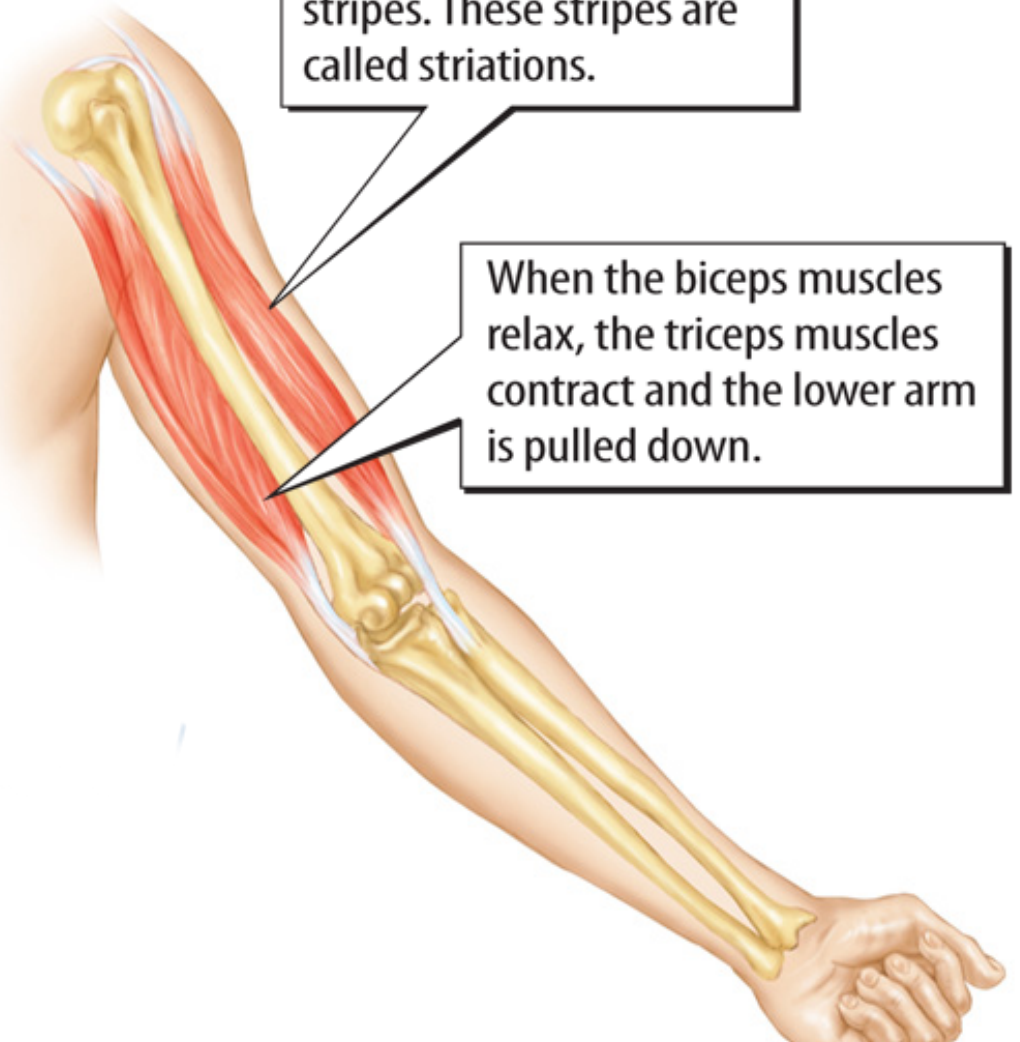
skeletal

When the biceps muscles contract, the muscle shortens, pulling the lower arm up.



Long, thin skeletal muscle cells look like they have stripes. These stripes are called striations.

When the biceps muscles relax, the triceps muscles contract and the lower arm is pulled down.



Types of Muscles

skeletal

- Your skeletal muscles can change throughout your lifetime.
- If you exercise, your muscle cells get larger. Then, your entire muscle becomes larger and stronger.



Types of Muscles

skeletal

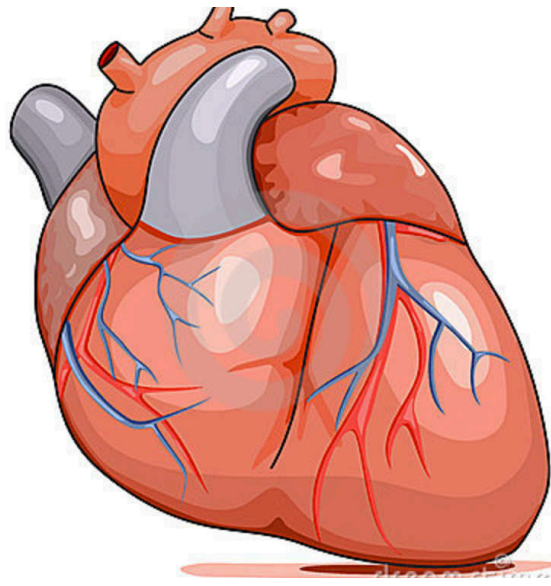
- Your skeletal muscles can change throughout your lifetime.
- If you exercise, your muscle cells get larger. Then, your entire muscle becomes larger and stronger.



Types of Muscles

cardiac

- Your heart is made of cardiac muscles, which are found only in the heart.
- A cardiac muscle is a type of involuntary muscle, which is muscle you cannot consciously control.



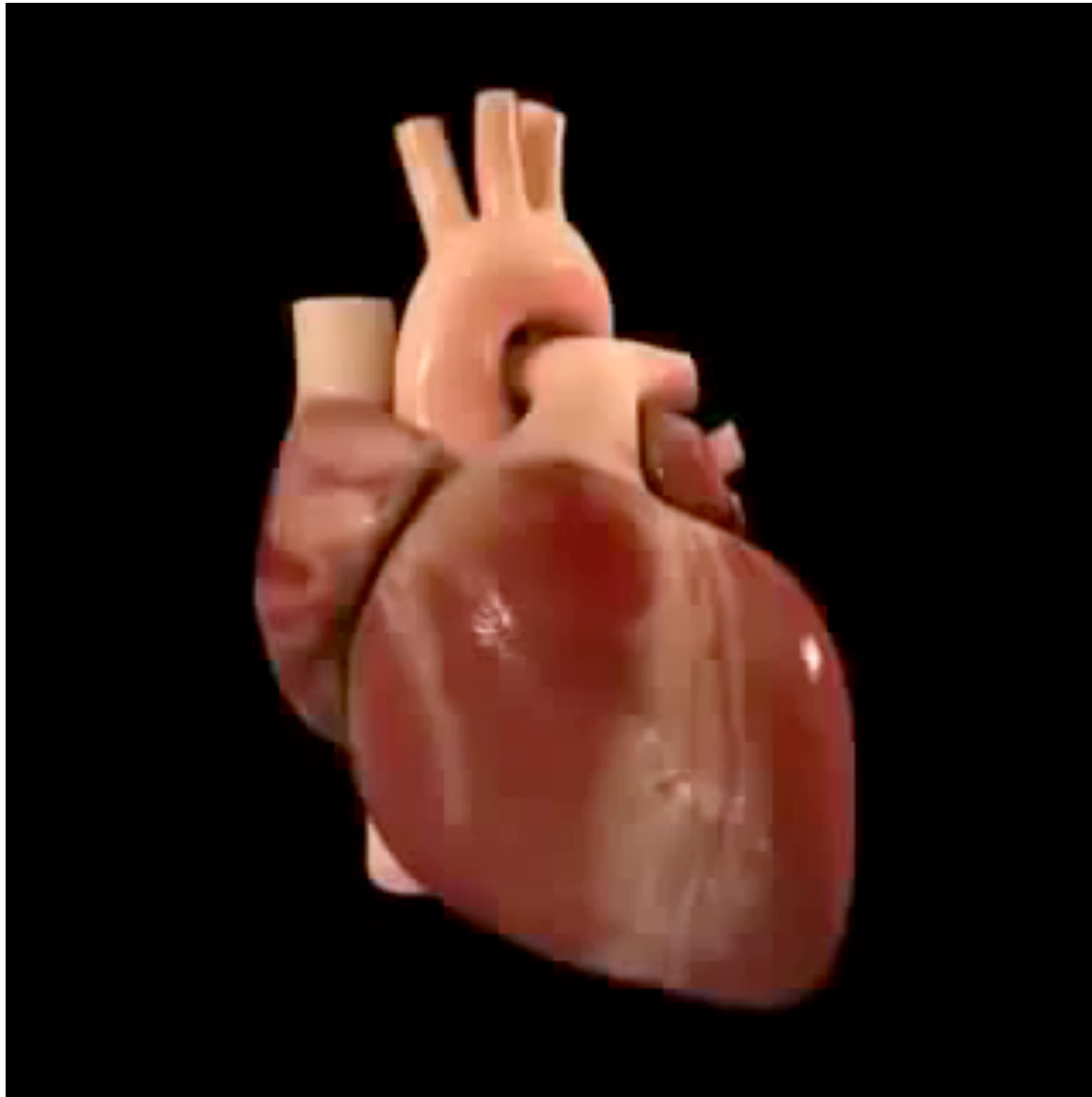
Types of Muscles

cardiac

- As cardiac muscles contract and relax, they pump blood through your heart and through vessels throughout your body.
- Cardiac muscle cells have branches with discs at their ends. These discs send signals to other cardiac muscle cells.
- The signals cause all the cardiac muscle cells to contract at almost the same time.

Types of Muscles

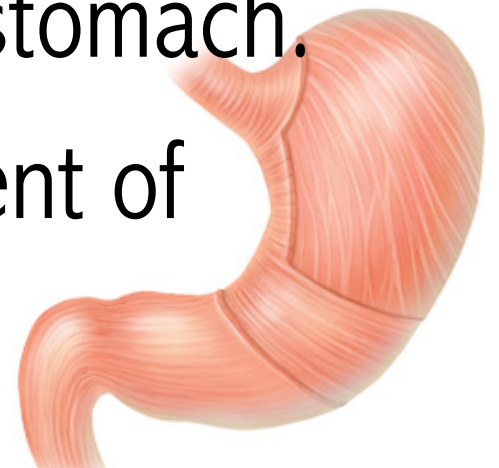
cardiac



Types of Muscles

smooth

- Smooth muscles line your blood vessels and many of your organs.
- Smooth muscles are involuntary muscles named for their smooth appearance.
- Contraction of smooth muscles helps move material through your body, such as food in your stomach.
- Smooth muscles also control the movement of blood through your vessels.



Types of Muscles

smooth



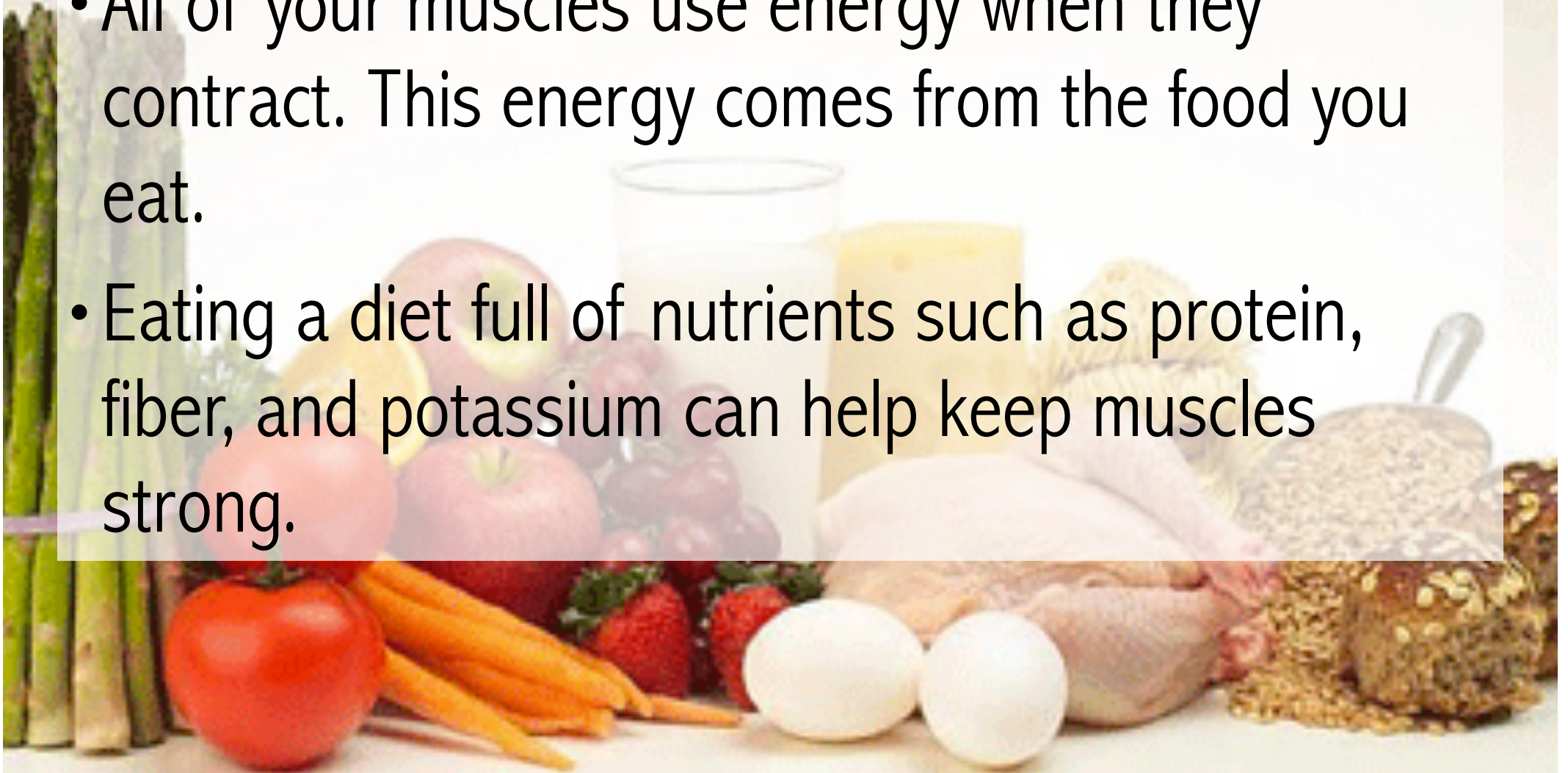
Types of Muscles

smooth

Normal Ureter in a dog, showing peristaltic contractions

Healthy Muscles

- Your muscles need a healthful diet.
- All of your muscles use energy when they contract. This energy comes from the food you eat.
- Eating a diet full of nutrients such as protein, fiber, and potassium can help keep muscles strong.



Healthy Muscles

- Exercise also helps keep your muscles healthy.
- Muscle cells get smaller and weaker without exercise. Weak muscles can increase the risk of heart disease.
- Bone injuries can happen more often when muscles are not healthy.
- Joints might not be as stable when muscles are small and weak.



The Muscular System & Homeostasis

- There are many ways the muscular system helps your body maintain homeostasis.
- Your body temperature must stay around 37°C to function well. When your muscles contract, they convert chemical energy to thermal energy. The thermal energy keeps your body warm.

The Muscular System & Homeostasis

- When you exercise, your cells use more oxygen and release more waste, such as carbon dioxide.
- The cardiac muscles in your heart help maintain homeostasis by contracting more often.
- When your heart contracts faster, it pumps more blood and more oxygen is carried to the cells.