

# Move Your Muscles!

by Sharon Guynup

## Muscles keep you on the go. Here's how they work and why you need to keep them in tip-top shape.

Picture this: You're out shooting hoops with your friends. As you take a jump shot, you suddenly feel your leg twist beneath you. *Ouch!* You might have sprained your ankle. But why did you sprain it? How can you keep from hurting it again? What is a sprain, anyway?

It all has to do with your muscles (more on that sprain later). When you walk down the street, ride your bike, or even yell hello to a friend, you are using muscles. Here's the good news: everyone can have stronger muscles and prevent injuries.



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### Muscles: A Lot of Work!

The human body has three types of muscle. There are skeletal, smooth, and cardiac muscles. Smooth and cardiac muscles work without you having to control them. This means they are involuntary. Some body parts that have smooth muscle include the stomach, intestines, and eyes. Cardiac muscle can only be found in the heart.

Skeletal muscle is the most common type of muscle in the body. Skeletal muscles are responsible for almost all of the body's movements. These muscles are usually attached to bones by strong tissue called tendons. Your body has more than 650 skeletal muscles. They make up about 40 percent of your body weight. Skeletal muscles are generally voluntary, which means you can control them. These muscles help you run, jump, and do all kinds of activities. And they can be injured if you don't take proper care of them.

Skeletal muscles are different sizes and shapes, depending on their job. Back muscles are some of the biggest and strongest muscles in your body because they help hold you upright. Smaller muscles in your hands let you bend your fingers.

Skeletal muscles work in a simple way. They react when they receive electrical signals from

your nerves. The signals are like messages from your brain. For example, when you swing a bat to whack a baseball, a nerve signal travels from your brain to your arm muscles, making them move. Nerve signals also let your brain know whether a muscle has been hurt, like if you twist your arm while swinging that bat.

## What Pain Means

Taking good care of your muscles can help prevent you from sitting on the sidelines. This happened to Anita R., a 10-year-old soccer player from New York City. Anita felt pain under her right kneecap. "If I put pressure on it or went up and down the stairs a lot, it would sting and throb," Anita says. Her doctor thought that she "was kicking more [with] one leg and had more muscle in that leg than in the other." Anita had to go to physical therapy, where she did exercises to help her knee heal.

Your body moves by using muscles, bones, tendons, and ligaments. Ligaments usually connect bones together. Muscles, ligaments, and tendons can be injured if you push them too hard. For example, a tough run or a fall might lead to a pain in your leg. How do you know what's happening when you feel pain? Here's what might be going on.

- **Muscle aches** may be caused by tension, overuse, or muscle injury from hard physical activities.
- **Sprains** and **strains** can also result from being active. A sprain is a stretched or torn ligament. Such an injury might happen if you trip or fall. A strain is a torn or pulled muscle or tendon. It can happen when you pick up something heavy. Sprains and strains are common injuries in sports.
- A **repetitive motion disorder (RMD)** is a damaged muscle, tendon, or ligament caused by making the same motion again and again. RMDs are common in the hands, wrists, and shoulders. Teens who spend a lot of time playing musical instruments or video games are at risk for RMDs. Two RMDs are *tendonitis*, a swollen tendon, and *carpal tunnel syndrome*, which can be caused by swelling in a tunnel-shaped area formed by bone and ligaments in the wrist.

To avoid hurting your muscles, warm them up before exercising, says David Waymann, an exercise physiologist at the University of Michigan Health System. Walk or jog in place for at least five minutes to get blood to your muscles. "Don't use stretching as a substitute for a warm-up," Waymann says. After exercising, cool down by walking slowly. Finally, stretch for a few minutes to keep joints and muscles from getting stiff.

Keeping your weight at a healthy level can keep your joints safe from extra strain, advises Dr.

Letha Griffin, an orthopedist in Atlanta.

When you aren't active, muscles can get weak and shrink. Exercise regularly to strengthen muscles. Don't play when you're tired, sick, or in pain, and don't overdo it. Take care of your muscles, and they'll keep you on the go!

## Fun Facts About Muscles

- Where are the busiest muscles in your body? In your eyes! Scientists estimate that the eye muscles move about 100,000 times a day.
- Your muscles are always partly contracted. That maintains muscle tone, keeping muscles firm and healthy. It is the only skeletal muscle activity that you cannot control.
- The body's largest muscle is the gluteus maximus muscle in the buttocks.
- Growing pains can cause intense muscle pains in your legs. They usually start before bedtime and sometimes continue through the night. They usually stop when kids stop growing.

## Muscles On the Move

Skeletal muscles, along with bones, joints, tendons, ligaments, and cartilage, make up the musculoskeletal system. Here's what they do:

- **Joints** are connections where two or more bones meet, making the skeleton flexible. Two examples of joints are elbows and knees. Bones are held together by strong straps of tissue called **ligaments**.
- Skeletal muscles are attached to bones by tough cords called **tendons**. Tendons and bones move along with your muscles, such as when you wave your hand or tilt your head.
- Slippery, rubbery **cartilage** covers the ends of bones at joints. It makes the connections between the bones flexible. Cartilage also protects bones from wear and tear at joints.
- Muscles contain fibers. **Slow-twitch muscle fibers** can work hard for a long time without getting tired on a long run or bike ride. **Fast-twitch fibers** help with quick movements, such as jumping to catch a ball or sprinting. Most muscles are a mixture of slow- and fast-twitch fibers.



# strain

# strain

## Definition

### verb

1. to bring something close to its breaking point.

*Their frequent arguments strained their marriage.*

2. to hurt or injure something by using it too much.

*He strained a muscle while playing softball.*

3. to remove the solid things from a liquid.

*She strained the vegetables for her baby.*

4. to pull with energy or force.

*The dog strained on its leash.*

### noun

1. an injury caused by putting too much force on a muscle.

*The strain in his back was caused by lifting heavy boxes.*

## Advanced Definition

### transitive verb

1. to pull or stretch to a high degree of tension.
2. to exert or extend to the maximum.
3. to push beyond limit, reason, or endurance.
4. to injure, impair, or weaken by excessive stress.

*He strained a muscle during practice.*

5. to cause through stress, mechanical failure of.
6. to pass (a substance) through a sieve or filter.

*The chef strained the sauce.*

7. to remove (something) by filtering.

*The chef strained the lumps from the sauce.*

**intransitive verb**

1. to pull energetically or forcibly.
2. to expend the maximum amount of effort; strive.
3. to put one's nerves and muscles under the maximum amount of stress.
4. to filter, trickle, or percolate through something.

**noun**

1. the act or process of straining.
2. the condition of being strained.
3. an injury or impairment resulting from placing too much stress on some part of the body.
4. extreme pressure or force, sometimes causing harm or deformity.
5. severe or exhausting emotional pressure.

**These are some examples of how the word or forms of the word are used:**

1. **Strain** is the overuse of a body part.
2. A **strain** is a torn or pulled muscle or tendon.
3. Playing only one sport can put too much **strain** on the same muscle groups.
4. Keeping your weight at a healthy level can keep your joints safe from extra **strain**, advises Dr. Letha Griffin, an orthopedist in Atlanta.
5. If you play tennis, you swing a tennis racket. That puts a lot of **strain** on your arm. If you switch to soccer, you give your arm a rest.
6. Population pressure will inevitably **strain** these resources. What's more, the competition for some of these resources-energy, water, food-will lead to global conflict.
7. It enables the whales to **strain** the small creatures from the seawater. To feed, the humpback whale will gulp a mouthful of small fish, plankton, or krill and then let the water flood out.
8. This can place further **strain** on the water supply and worsen the original problem of the drought. Sometimes, an imbalance in the system, such as a lack of water, can enter into a feedback loop where the situation only gets worse and worse.
9. But the **strain** of her work took its toll, and she was ordered to Europe by her doctor for a rest cure in 1869. While abroad Barton came into contact with the International Committee of the Red Cross.

# tension                      ten        ·        sion

## Definition

### noun

1. physical or mental pressure.

*Michael has tension in his shoulders from working at a computer all day.*

*Not having enough money can cause tension in a marriage.*

## Advanced Definition

### noun

1. the act of stretching or state of being stretched; strain.
2. physical, mental, or emotional strain.
3. the strain created by disharmony in a relationship, as between people or nations.
4. electrical potential.

*high-tension wires*

## Spanish cognate

*tensión*: The Spanish word *tensión* means tension.

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## These are some examples of how the word or forms of the word are used:

1. "Wow, there's a lot of **tension** in that room," she said, dropping her duffle onto the bed by the window.
2. In 1994, simmering **tensions** between two ethnic groups in Rwanda, the Hutu and the Tutsi, culminated in civil war. The Hutu slaughtered 800,000 Tutsi in fewer than four months.
3. **Tensions** grew between the colonists and the British. In 1770, **tensions** erupted with the Boston Massacre. British troops in Boston found themselves confronted by a crowd of angry colonists. The crowd shouted at the troops and threw snowballs and other small objects at them.
4. He would keep it his secret, his special place, reserved for the times his family let the **tension** build up and bubble around them. He would vacation in the attic with the lovely old music and drift away to another time when he needed to.
5. Piano tuning is part art and part science. You're trying to get the arrangement of fourths, fifths, sixths, thirds-all musical intervals-so that when you play them, they waver at the right

speeds. Gordon listens to intervals when he's tuning. Tuning the pin adjusts the **tension** on the string, which, in turn, adjusts the pitch.

6. Nonviolent direct action seeks to create such a crisis and establish such creative **tension** that a community that has constantly refused to negotiate is forced to confront the issue. It seeks so to dramatize the issue that it can no longer be ignored. I just referred to the creation of **tension** as a part of the work of the nonviolent resister. This may sound rather shocking. But I must confess that I am not afraid of the word **tension**. I have earnestly worked and preached against violent **tension**, but there is a type of constructive nonviolent **tension** that is necessary for growth.



Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. According to the text, what are the three types of muscle in the human body?

- A. arm, leg, and wrist
- B. sprains, strains, and aches
- C. ligaments, tendons, and joints
- D. skeletal, smooth, and cardiac

2. The author divides the text into sections with subheadings. What does the author describe in the section with the subheading "Muscles: A Lot of Work!"?

- A. how to strengthen muscles and prevent injuries
- B. different kinds of muscles and how they work
- C. what makes up the musculoskeletal system
- D. the difference between muscle aches, sprains, and strains

3. Muscles can be injured if you don't take proper care of them.

What evidence from the text supports this statement?

- A. "Smooth and cardiac muscles work without you having to control them."
- B. "The body's largest muscle is the gluteus maximus muscle in the buttocks."
- C. "To avoid hurting your muscles, warm them up before exercising."
- D. "Your body moves by using muscles, bones, tendons, and ligaments."

4. What is an example from the text of a way that people can strengthen muscles and prevent injuries?

- A. overusing muscles during hard physical activities
- B. exercising regularly to strengthen muscles
- C. making the same motions again and again
- D. being active by picking up heavy things

5. What is the main idea of this text?

- A. Muscles keep our body going as long as we take proper care of them.
- B. Sprains and strains keep our body moving as long as we keep getting them.
- C. Vessels keep our bodies moving as long as we keep taking care of them.
- D. Tendons keep our bodies moving as long as we keep injuring them.

6. Read this sentence from the text.

Sprains and strains can also result from being **active** . A sprain is a stretched or torn ligament. Such an injury might happen if you trip or fall. A strain is a torn or pulled muscle or tendon. It can happen when you pick up something heavy.

Based on these sentences, what does the word "**active**" mean?

- A. in the middle of falling down on the floor
- B. in the middle of doing something with energy
- C. in the middle of sleeping deeply
- D. in the middle of lying down comfortably

7. Choose the answer that best completes the sentences.

To avoid hurting your muscles, warm them up before exercising, says David Waymann, an exercise physiologist at the University of Michigan Health System. \_\_\_\_\_, walk or jog in place for at least five minutes to get blood to your muscles.

- A. Earlier
- B. In contrast
- C. However
- D. For example

**8.** Give two examples of how we can take proper care of our muscles. Support your answer with evidence from the text.

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**9.** Give two examples of the kinds of injuries you might feel if you don't take proper care of your muscles. Support your answer with evidence from the text.

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**10.** Why might it be especially important for active people to take care of their muscles? Support your answer with evidence from the text.

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