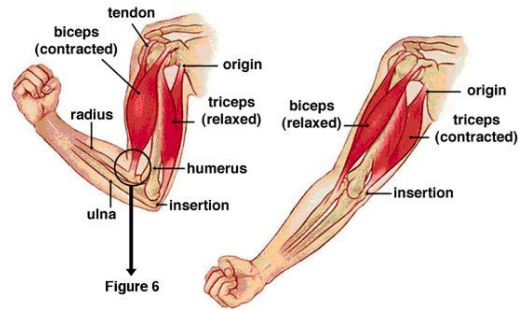


Unit 6b Muscular System



<http://www.zoodu.com/uploads/images/2006-08-10/vit9QA12A5.jpg>

Muscle Actions and Comparisons

Mrs. Michaelsen
Chetek High School

8.4 Muscular Responses

A. Threshold Stimulus

1. In order for a muscle fiber to
2. It will not contract until it

8.4 Muscular Responses

B. All-or-None Response

1. Each individual muscle fiber either
2. There are never any
3. A contraction that requires more force uses

8.4 Muscular Responses

C. Recording a Muscle Contraction

1. Muscle contractions can be recorded and graphed -
2. When a single muscle is stimulated, it undergoes

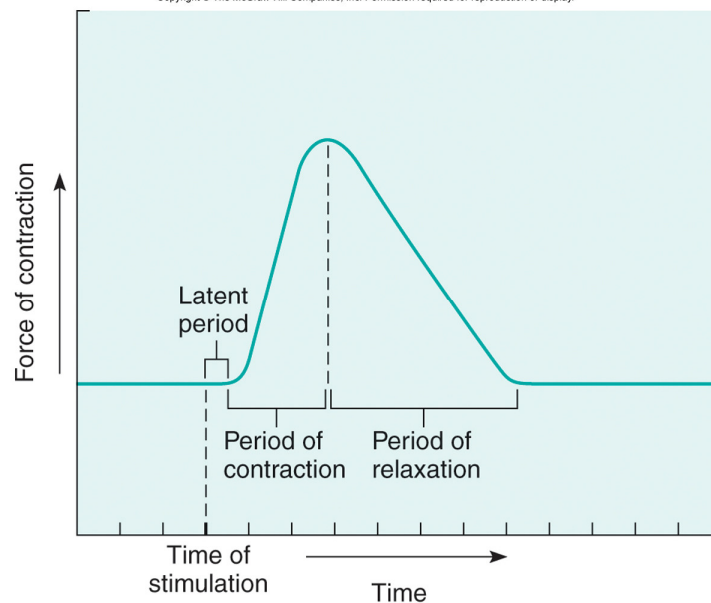
8.4 Muscular Responses

- This is called a
- The time period between the stimulus and the twitch is called the

8.4 Muscular Responses

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A myogram of a single muscle twitch.



8.4 Muscular Responses

- c. Muscle fibers are either
 - i. Slow twitch cells are
 - ii. Fast twitch cells are

8.4 Muscular Responses

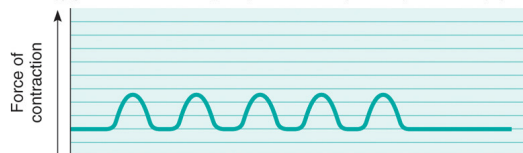
- 3. When **multiple** stimuli are received by the muscle, the muscle is
 - a. This causes the forces of the individual contractions to be

8.4 Muscular Responses

4. If the multiple signals come too **fast** and there is not time for
 - a. This is also known as
 - b. This can be caused by

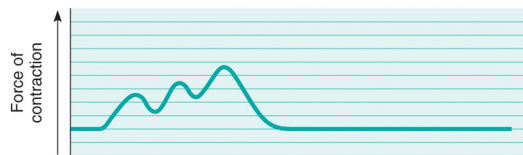
8.4 Muscular Responses

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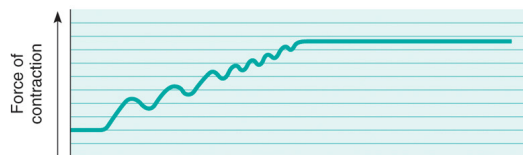


(a)

Myograms of
 a) a series of twitches,
 b) summation, and
 c) a tetanic contraction.



(b)



(c)

8.4 Muscular Responses

D. Recruitment of Motor Units

1. Because several **individual** muscle cells are controlled by a **single** motor neuron (a motor **unit**),

2. Each motor unit within a muscle has

8.4 Muscular Responses

- a. This allows the **brain**
 - i. As a higher threshold

 - ii. This is called

8.4 Muscular Responses

E. Sustained Contractions

1. Individual

2. More often, a muscle receives a

8.4 Muscular Responses

4. Even while your body is at **rest**, some smaller muscle fibers are contracting in sustained contraction to help maintain your
 - a. This is called

8.7 Skeletal Muscle Actions

A. Origin and Insertion

1. All skeletal muscles are attached to
 - a. One end is typically attached to an
 - i. This is called the
 - b. The other end of the muscle is typically attached to a.
 - i. This is called the
2. Some muscles, like the biceps brachii, have

8.7 Skeletal Muscle Actions

B. Interaction of Skeletal Muscles

1. Most skeletal muscles function in
 - a. One muscle
 - b. This is because muscles can only

8.7 Skeletal Muscle Actions

2. The muscle in the pair that provides the majority of the movement is called the
 - a. Other muscles that aid in the movement are called

3. The opposite muscle or muscles to the prime mover and the synergists are called the
 - a. These muscles provide the

Comparison of Muscle Types

So far, we have primarily talked about skeletal muscle.

This section will compare smooth and cardiac muscle to skeletal muscle.

8.5 Smooth Muscle

A. The contractile **mechanism** is essentially the same as

1. Smooth muscle are triggered to contract by both

8.5 Smooth Muscle

2. Many
3. Smooth muscle cells contract and relax more **slowly**, but can also **sustain** their contractions
4. Smooth muscles cells can

8.5 Smooth Muscle

- B. The actin and myosin filaments in the myofibrils of smooth muscle are organized more
 - 1. This is why smooth muscle cells do not have

8.5 Smooth Muscle

- C. There are two major types of smooth muscle.
 - 1. smooth muscle.
 - a. The individual muscle cells are
 - b. Found in the

8.5 Smooth Muscle

2. smooth muscle.
 - a. This type of smooth muscle is made up of
 - b. Found lining the walls of (stomach, intestines, bladder, uterus, etc.)
 - a. Visceral smooth muscle itself is **exciting** meaning that individual cells can
 - b. It can also be

8.6 Cardiac Muscle

- A. **Cardiac** muscle is found only in the
- B. The contraction **mechanism** is again, essentially the same as skeletal and smooth muscle.
 1. The way

8.6 Cardiac Muscle

C. Cardiac muscle cells connect to each other at structures called

D. Cardiac muscle cells are both