Answer Key

The Muscular System: Shoulder and Arm

A muscular system lab activity using Visible Body’s Human Anatomy Atlas

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This lab activity is aligned with Visible Body’s Human Anatomy Atlas app.

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PRE-LAB EXERCISES

Before coming to lab, get familiar with a few muscle groups we'll be exploring during lab. Using Visible Body’s Human Anatomy Atlas, go to the Views section. Under Systems, scroll down to the Muscular System views. Select View 11. Shoulder, and find the following muscles. When you select a muscle, note the book icon in the content box. Selecting this icon allows you to read the muscle’s definition.

1. Pectoralis major
2. Latissimus dorsi

Define the following terms:

1. Extension
2. Flexion
3. Abduction
4. Adduction
5. Rotation
IN-LAB EXERCISES

Use the following modules to guide your exploration of the shoulder and arm regions of the muscular system. As you explore the modules, locate the muscles on any charts, models, or specimen available. These muscles are located in and act on the shoulder and arm regions. Because the glenoid cavity of the scapula is shallow and does not snugly fit the head of the humerus, the tendons of multiple muscles are involved in securing and stabilizing the humerus at the shoulder to prevent dislocation. Other muscles will cross the shoulder (glenohumeral) joint and insert on the arm, causing the arm to move when they contract.

Movement of the brachium, or upper arm, depends on the fixators of the shoulder to keep the scapula in place so the arm can move freely. Once we move down into the antebrachium (forearm) and hand, the muscles begin to get smaller and more numerous, which grants us our fine motor skills when we write or play the piano. Pay attention to whether the muscle is on the anterior or posterior side of the arm – muscles on the anterior side will flex, while muscles on the posterior side will extend. The long names of some of these muscles can be daunting, but they are often very descriptive. You can find origins, insertions, actions, and/or locations of these muscles simply in the names.

When reviewing the action of a muscle, it will be helpful to think about where the muscle is located and where the insertion is. Muscle physiology requires that a muscle will “pull” instead of “push” during contraction, and the insertion is the part that will move. Imagine that the muscle is “pulling” on the bone or tissue it is attached to at the insertion.

Access 3D views and animated muscle actions in Visible Body’s Human Anatomy Atlas, which will be especially helpful to visualize muscle actions. When you select a structure in the Atlas app, you’ll see options to read the definition and hear the pronunciation in the content box. When you select a muscle, be sure to select the blue pin icon in the content box. This will give you the option to view origins and insertions as visible pins on the muscle (select Attachments), view the blood supply, and/or the nerve supply.

In each module below, identify the following:

• Muscle location
• Origin(s) and insertion(s)
• Muscle action
• Nerve supply
A. Muscles of the Shoulder

Muscles of the Shoulder

**View the following Muscle Actions:**

<table>
<thead>
<tr>
<th>Shoulder flexion</th>
<th>Shoulder lateral rotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shoulder extension</td>
<td>Scapula elevation</td>
</tr>
<tr>
<td>Shoulder horizontal abduction</td>
<td>Scapula depression</td>
</tr>
<tr>
<td>Shoulder horizontal adduction</td>
<td>Scapula abduction</td>
</tr>
<tr>
<td>Shoulder abduction</td>
<td>Scapula adduction</td>
</tr>
<tr>
<td>Shoulder adduction</td>
<td>Scapula upward rotation</td>
</tr>
<tr>
<td>Shoulder medial rotation</td>
<td>Scapula downward rotation</td>
</tr>
</tbody>
</table>

Try performing these actions yourself and feel which muscles contract.

These muscles primarily act to stabilize the scapula and move the arm. Since the scapula is a moveable bone, it must be stabilized in order for the arm to be able to move.

Some of these muscles are prime movers of the arm. They all cross the shoulder joint to insert on the humerus. Remember that muscles pull, and imagine how the muscle will pull on the humerus as it contracts.
View 11. Shoulder

- Deltoid
- Pectoralis major
- Latissimus dorsi
View 11. Shoulder

- Supraspinatus
- Infraspinatus
- Teres major
- Deltoid
- Teres minor
- Coracobrachialis
- Latissimus dorsi
<table>
<thead>
<tr>
<th>Muscle</th>
<th>Origin</th>
<th>Insertion</th>
<th>Action</th>
<th>Innervation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pectoralis major</td>
<td>Anterior surface of sternal portion of clavicle, anterior surface of sternum, cartilages of true ribs, aponeurosis of external oblique</td>
<td>Crest of the greater tubercle of the humerus</td>
<td>Adducts and flexes arm and rotates it medially</td>
<td>Medial pectoral and lateral pectoral nerves</td>
</tr>
<tr>
<td>Pectoralis minor</td>
<td>Ribs 3-5</td>
<td>Coracoid process of the scapula</td>
<td>Elevates ribs, draws the scapula down and medially</td>
<td>Medial pectoral nerve</td>
</tr>
<tr>
<td>Deltoid</td>
<td>Lateral clavicle, acromion, scapular spine</td>
<td>Deltoid tuberosity of the humerus</td>
<td>Abduction, flexion, extension, lateral and medial rotation of humerus</td>
<td>Axillary nerve</td>
</tr>
<tr>
<td>Latissimus dorsi</td>
<td>Spinous processes of T7-T12 and L1-L5</td>
<td>Intertubercular groove of the humerus</td>
<td>Medial rotation, adduction, and extension of humerus, respiration</td>
<td>Thoracodorsal nerve</td>
</tr>
<tr>
<td>Infraspinatus</td>
<td>Infraspinatus fossa</td>
<td>Greater tubercle of the humerus</td>
<td>Laterally rotates arm, stabilizes shoulder joint</td>
<td>Suprascapular nerve</td>
</tr>
<tr>
<td>Supraspinatus</td>
<td>Supraspinatus fossa</td>
<td>Greater tubercle of the humerus</td>
<td>Abducts arm, stabilizes shoulder joint</td>
<td>Suprascapular nerve</td>
</tr>
<tr>
<td>Subscapularis</td>
<td>Subscapular fossa</td>
<td>Lesser tubercle of the humerus</td>
<td>Medial rotation of head humerus</td>
<td>Upper and lower subscapular nerves</td>
</tr>
<tr>
<td>Coracobrachialis</td>
<td>Coracoid process of the scapula</td>
<td>Medial surface and border of humerus</td>
<td>Adduction and flexion of humerus</td>
<td>Musculo-cutaneous nerve</td>
</tr>
<tr>
<td>Muscle</td>
<td>Origin</td>
<td>Insertion</td>
<td>Action</td>
<td>Innervation</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------</td>
<td>------------------------------------------</td>
<td>------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Teres major</td>
<td>Inferior angle of scapula</td>
<td>Intertubercular groove of humerus</td>
<td>Extension, adduction, medial rotation of the humerus</td>
<td>Lower subscapular nerve</td>
</tr>
<tr>
<td>Teres minor</td>
<td>Lateral border of scapula</td>
<td>Greater tuberosity of humerus</td>
<td>Lateral rotation of the humerus, stabilizes shoulder joint</td>
<td>Axillary nerve</td>
</tr>
</tbody>
</table>
B. Muscles of the Torso that Act on the Scapulae


- Rotate the model so you see the posterior side.
- Select the left side of the trapezius and hide it.
- Observe the following deep muscles that act on the scapulae.

View 20. Muscular System View

- Levator scapulae
- Rhomboideus major
- Rhomboideus minor
<table>
<thead>
<tr>
<th>Muscle</th>
<th>Origin</th>
<th>Insertion</th>
<th>Action</th>
<th>Innervation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhomboideus major</td>
<td>Spinous processes T2-T5</td>
<td>Medial border of scapula below spine</td>
<td>Steadies scapula, moves inferior angle posteriorly and superiorly</td>
<td>Dorsal scapular nerve</td>
</tr>
<tr>
<td>Rhomboideus minor</td>
<td>Spinous processes C7-T1</td>
<td>Medial border of scapula above spine</td>
<td>Steadies scapula, moves inferior angle posteriorly and superiorly</td>
<td>Dorsal scapular nerve</td>
</tr>
<tr>
<td>Levator scapulae</td>
<td>Transverse processes C1-C4</td>
<td>Superior part of medial border of scapula</td>
<td>Elevates the scapula medially and superiorly</td>
<td>Dorsal scapular nerve and direct branches from spinal nerves</td>
</tr>
</tbody>
</table>
C. Muscles of the Elbow


These muscles are all located on the anterior side of the humerus and cross the elbow to insert on the radius or ulna. When these muscles contract, the arm will flex at the elbow. Biceps brachii is named for its “two heads;” note the two different origins of this muscle.

View 12. Elbow

- Biceps brachii (long head)
- Biceps brachii (medial head)
- Brachioradialis
- Brachialis
<table>
<thead>
<tr>
<th>Muscle</th>
<th>Origin</th>
<th>Insertion</th>
<th>Action</th>
<th>Innervation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biceps brachii (long and short heads)</td>
<td>Supraglenoid tubercle of the scapula (long), and coracoid process (short)</td>
<td>Radial tuberosity</td>
<td>Flexion and supination of elbow</td>
<td>Musculocutaneous nerve</td>
</tr>
<tr>
<td>Brachialis</td>
<td>Anterior distal half of humerus</td>
<td>Ulnar tuberosity and anterior surface of coronoid process</td>
<td>Flexion of elbow</td>
<td>Musculocutaneous nerve, radial nerve</td>
</tr>
<tr>
<td>Brachioradialis</td>
<td>Ridge superior to lateral epicondyle of humerus, lateral intermuscular septum</td>
<td>Styloid process of radius</td>
<td>Flexion of elbow</td>
<td>Radial nerve</td>
</tr>
</tbody>
</table>
These muscles are located on the posterior side of the forearm, and will cross the elbow joint to cause extension of the arm at the elbow when they contract. Note the three different origins of the three heads of the triceps brachii.

**View Muscle Action: Elbow extension**

**Muscle Action: Elbow Extension**

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Origin</th>
<th>Insertion</th>
<th>Action</th>
<th>Innervation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triceps brachii</td>
<td>Posterior surface of humerus (lateral), infraglenoid tuberosity (long), posterior surface of humerus below groove (medial)</td>
<td>Olecranon of the ulna</td>
<td>Extension of the elbow</td>
<td>Radial nerve</td>
</tr>
<tr>
<td>(medial head)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anconeus</td>
<td>Back of the lateral epicondyle of the humerus</td>
<td>Side of olecranon and proximal dorsal surface of ulna</td>
<td>Extension of the elbow</td>
<td>Radial nerve</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
These muscles either pronate the forearm (turn the palm up), or supinate it (turn the palm down).

**View Muscle Actions: Forearm pronation and Forearm supination**

**Muscle Action: Forearm Pronation**

*Pronator teres*

*Pronator quadratus*
### Muscle Action: Supination

![Supinator muscle](image)

#### Forearm: Pronation and Supination

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Origin</th>
<th>Insertion</th>
<th>Action</th>
<th>Innervation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pronator teres</td>
<td>Medial epicondyle of humerus, coronoid process of ulna</td>
<td>Lateral surface of radius</td>
<td>Pronates and flexes forearm</td>
<td>Median nerve</td>
</tr>
<tr>
<td>Pronator quadratus</td>
<td>Distal fourth of anterior surface of the ulna</td>
<td>Distal fourth of anterior surface of the radius</td>
<td>Pronates hand</td>
<td>Median nerve</td>
</tr>
<tr>
<td>Supinator</td>
<td>Lateral epicondyle of humerus, ulna, radial collateral ligaments and annular ligaments</td>
<td>Dorsal and lateral surfaces of the body of the radius</td>
<td>Supinates hand and forearm</td>
<td>Deep radial nerve</td>
</tr>
</tbody>
</table>
These muscles make up the anterior compartment of the forearm, and cross the wrist to insert on the hand. They all function to flex the wrist and/or the fingers when they contract. These muscles have long names, but the names are very descriptive of where the muscle is located and its action.

**View Muscle Actions:**
- Wrist flexion
- Wrist abduction
- Wrist adduction

**Muscle Action: Wrist Flexion**

- **Flexor carpi radialis**
- **Flexor digitorum superficialis**
- **Flexor carpi ulnaris**
- **Palmaris longus**
**Muscle Action: Wrist Abduction**

- Extensor carpi radialis longus
- Flexor carpi radialis
- Abductor pollicis longus
- Extensor pollicis brevis
- Extensor carpi radialis brevis

**Muscle Action: Wrist Adduction**

- Flexor carpi ulnaris
- Extensor carpi ulnaris
These muscles also flex the hand, and are located deep to the hand flexors above.

### Hand: Superficial Flexors

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Origin</th>
<th>Insertion</th>
<th>Action</th>
<th>Innervation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexor carpi radialis</td>
<td>Medial epicondyle of humerus</td>
<td>Base of second and third metacarpals</td>
<td>Flexion and abduction (radial) of the hand</td>
<td>Median nerve</td>
</tr>
<tr>
<td>Palmaris longus</td>
<td>Medial epicondyle of humerus</td>
<td>Palmar aponeurosis and flexor retinaculum</td>
<td>Flexes hand, tenses flexor retinaculum</td>
<td>Median nerve</td>
</tr>
<tr>
<td>Flexor carpi ulnaris</td>
<td>Medial epicondyle of humerus, olecranon of ulna</td>
<td>Pisiform, hamate, base of metacarpal 5</td>
<td>Pisiform, hamate, base of metacarpal 5</td>
<td>Ulnar nerve</td>
</tr>
<tr>
<td>Flexor digitorum superficialis</td>
<td>Medial epicondyle of humerus, coronoid process of ulna, below radial tuberosity</td>
<td>Middle phalanx of digits 2-5</td>
<td>Flexes wrist, flexes middle and proximal phalanges of digits 2-5</td>
<td>Median nerve</td>
</tr>
</tbody>
</table>

### Hand: Deep Flexors

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Origin</th>
<th>Insertion</th>
<th>Action</th>
<th>Innervation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexor pollicis longus</td>
<td>Anterior surface of radius and interosseous membrane</td>
<td>Base of distal phalanx of thumb</td>
<td>Flexes distal phalanx of thumb</td>
<td>Median nerve</td>
</tr>
<tr>
<td>Flexor digitorum profundus</td>
<td>Proximal ⅔ of the anterior and medial surfaces of the ulna and the interosseous membrane</td>
<td>Base of palmar surface of distal phalanges 2-5</td>
<td>Flexes wrist, flexes distal phalanx digits 2-5</td>
<td>Median and ulnar nerves</td>
</tr>
</tbody>
</table>
These muscles are located on the posterior side of the forearm and cross the wrist to insert on the hand. When these muscles contract, the wrist and/or fingers will extend.

**View Muscle Actions:**
- Wrist extension
- Wrist abduction
- Wrist adduction

**Muscle Action: Wrist Extension**
<table>
<thead>
<tr>
<th>Muscle</th>
<th>Origin</th>
<th>Insertion</th>
<th>Action</th>
<th>Innervation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extensor carpi radialis longus</td>
<td>Lower third of the lateral supracondylar ridge of humerus</td>
<td>Dorsal surface of base of second metacarpal</td>
<td>Extension and abduction of wrist</td>
<td>Radial nerve</td>
</tr>
<tr>
<td>Extensor carpi radialis brevis</td>
<td>Lateral epicondyle of humerus</td>
<td>Dorsal base of third metacarpal</td>
<td>Extension and abduction of wrist</td>
<td>Radial nerve</td>
</tr>
<tr>
<td>Extensor digitorum</td>
<td>Lateral epicondyle of humerus</td>
<td>Dorsal digital expansions of digits 2-4</td>
<td>Extension of wrist, extension and abduction of digits 2-5</td>
<td>Deep radial nerve</td>
</tr>
<tr>
<td>Extensor digiti minimi</td>
<td>Lateral epicondyle of humerus</td>
<td>Dorsal digital expansion of proximal phalanx of digit 5</td>
<td>Extension and abduction of wrist, extension of digit 5</td>
<td>Deep radial nerve</td>
</tr>
<tr>
<td>Extensor carpi ulnaris</td>
<td>Lateral epicondyle of humerus, dorsal surface of ulna</td>
<td>Tubercle on base of fifth metacarpal</td>
<td>Extension and adduction of wrist</td>
<td>Deep radial nerve</td>
</tr>
</tbody>
</table>
D. Muscles of the Wrist and Hand


View Muscle Actions: Thumb extension

These muscles are also located on the posterior compartment of the forearm, but are located deep to the muscles in the previous section. They will also cross the wrist to insert on the hand, functioning to move the first or second digit when contracted. It will be helpful to remember that “pollicis” is referring to the thumb and “indicis” to the index finger.

**Muscle Action: Thumb Extension**

- **Abductor pollicis longus**
- **Extensor pollicis longus**
- **Extensor pollicis brevis**
<table>
<thead>
<tr>
<th>Muscle</th>
<th>Origin</th>
<th>Insertion</th>
<th>Action</th>
<th>Innervation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abductor pollicis longus</td>
<td>Lateral dorsal surfaces of the radius and ulna</td>
<td>Radial side of base of metacarpal 1</td>
<td>Abduction at wrist and thumb</td>
<td>Deep radial nerve</td>
</tr>
<tr>
<td>Extensor pollicis longus</td>
<td>Lateral part of posterior surface of ulna</td>
<td>Base of proximal phalanx of thumb</td>
<td>Extension of thumb, abduction of wrist</td>
<td>Deep radial nerve</td>
</tr>
<tr>
<td>Extensor pollicis brevis</td>
<td>Dorsal surface of body of radius</td>
<td>Base of proximal phalanx of thumb</td>
<td>Extension of thumb, abduction of wrist</td>
<td>Deep radial nerve</td>
</tr>
<tr>
<td>Extensor indicis</td>
<td>Posterior surface of ulna</td>
<td>Posterior digital expansion of digit 2</td>
<td>Extension of the wrist and joints of digit 2</td>
<td>Deep radial nerve</td>
</tr>
</tbody>
</table>
These muscles move the first digit – the thumb. Earlier sections have included muscles that move the thumb, but are primarily located in the forearm. Thenar muscles are entirely located within the hand and form the thenar eminence – the fleshy protrusion in the hand at the base of the thumb.

**View Muscle Actions: Thumb flexion and Hand digits opposition**

**Muscle Action: Thumb Flexion**
**Muscle Action: Hand Digits Opposition**

- Opponens digiti minimi
- Abductor pollicis brevis
- Opponens pollicis
- Flexor pollicis brevis
These muscles all function to move digit 5, the little finger. These muscles are also entirely located within the hand.

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Origin</th>
<th>Insertion</th>
<th>Action</th>
<th>Innervation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abductor pollicis brevis</td>
<td>Flexor retinaculum, scaphoid, trapezium</td>
<td>Base of proximal phalanx of thumb</td>
<td>Abducts thumb</td>
<td>Median nerve</td>
</tr>
<tr>
<td>Opponens pollicis</td>
<td>Flexor retinaculum, scaphoid, trapezium</td>
<td>Lateral border of metacarpal 1</td>
<td>Opposition of thumb</td>
<td>Median nerve</td>
</tr>
<tr>
<td>Flexor pollicis brevis</td>
<td>Flexor retinaculum, capitate, trapezium</td>
<td>Radial side of proximal phalanx of thumb</td>
<td>Flexes thumb</td>
<td>Median and ulnar nerves</td>
</tr>
<tr>
<td>Adductor pollicis</td>
<td>Metacarpals 2-3, capitate</td>
<td>Medial surface of proximal phalanx of thumb</td>
<td>Adducts thumb</td>
<td>Ulnar nerve</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Origin</th>
<th>Insertion</th>
<th>Action</th>
<th>Innervation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abductor digiti minimi</td>
<td>Pisiform</td>
<td>Medial side of proximal phalanx digit 5</td>
<td>Abducts digit 5</td>
<td>Ulnar nerve</td>
</tr>
<tr>
<td>Flexor digiti minimi brevis</td>
<td>Hamate, flexor retinaculum</td>
<td>Base of proximal phalanx digit 5</td>
<td>Flexes digit 5</td>
<td>Ulnar nerve</td>
</tr>
<tr>
<td>Opponens digiti minimi</td>
<td>Hamate, flexor retinaculum</td>
<td>Ulnar border of metacarpal 5</td>
<td>Opposition of digit 5</td>
<td>Ulnar nerve</td>
</tr>
</tbody>
</table>
These muscles are located within the hand and are responsible for the fine movements of the fingers. The muscles listed in the chart below are actually groups of muscles. The number of muscles normally found in each group is in parentheses after the name.

**View Muscle Actions: Hand digits 2-5 flexion and Hand digits 2-5 extension**

**Muscle Action: Hand Digits 2-5 Flexion**
Muscle Action: Hand Digits 2-5 Extension

Dorsal interossei
Palmar interossei
Extensor digitorum
<table>
<thead>
<tr>
<th>Muscle</th>
<th>Origin</th>
<th>Insertion</th>
<th>Action</th>
<th>Innervation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lumbricals (4)</td>
<td>Tendons of flexor digitorum profundus</td>
<td>Extensor expansion of the same digit</td>
<td>Flexes MCP joint, extends PIP and DIP joints</td>
<td>Median and ulnar nerves</td>
</tr>
<tr>
<td>Palmar interossei (3)</td>
<td>One head from metacarpals of digits 2, 4, 5</td>
<td>Dorsal digital expansion of digits 2, 4, 5</td>
<td>Adduction and flexion of MCP joints, extension of interphalangeal joints</td>
<td>Ulnar nerve</td>
</tr>
<tr>
<td>Dorsal interossei (4)</td>
<td>Trapezium</td>
<td>Base of proximal phalanges digits 2-4</td>
<td>Abduction and flexion at MCP joints, extension of interphalangeal joints</td>
<td>Ulnar nerve</td>
</tr>
</tbody>
</table>
PUTTING IT ALL TOGETHER

1. Based on what you’ve learned about the muscles in this exercise, what do you think the following terms mean?
   a. Major - the larger muscle
   b. Minor - the smaller muscle
   c. Extensor - causes extension
   d. Flexor - causes flexion
   e. Longus - longer muscle
   f. Brevis - shorter muscle
   g. Spinatus - referring to the spine of the scapula
   h. Pollicis - referring to the thumb
   i. Carpi - referring to the wrist
2. Which muscles are part of the rotator cuff that serves to stabilize the shoulder joint?
   - Infraspinatus
   - Supraspinatus
   - Teres minor
   - Subscapularis

3. Which muscles are used when performing the following actions?
   a. Raising your hand high over your head during class
      Deltoid, supraspinatus
   b. Rowing a boat
      Deltoid, pectoralis major, latissimus dorsi, infraspinatus, supraspinatus, teres major, teres minor, subscapularis, coracobrachialis, biceps brachii, brachialis, triceps brachii
   c. Reaching behind you, arm extended and pronated
      Latissimus dorsi, infraspinatus, teres major, teres minor, triceps brachii, pronator teres, pronator quadratus
   d. Reaching in front of you, arm extended and supinated
      Pectoralis major, coracobrachialis, subscapularis, triceps brachii, supinator
   e. Bringing your hand to your heart
      Pectoralis major, brachialis, biceps brachii
   f. Holding a pencil
      Flexor digitorum profundus, opponens pollicis, lumbricals, palmar interossei

4. Carpal tunnel syndrome can result from repetitive motions in the fingers causing inflammation in the carpal tunnel – a space covered by the flexor retinaculum where tendons and nerves pass through the wrist. In this syndrome, the median nerve is compressed, which can lead to tingling, numbness, and muscle weakness. Which muscles are most likely to be affected by carpal tunnel syndrome?
   Flexor muscles of the forearm (superficial and deep)
Student Practice

Label the muscles in the following figures
View 11. Shoulder

- Deltoid
- Pectoralis major
- Latissimus dorsi
View 11. Shoulder

- Deltoid
- Teres minor
- Coracobrachialis
- Latissimus dorsi
- Supraspinatus
- Infraspinatus
- Teres major
View 20. Muscular System View

- **Levator scapulae**
- **Rhomboideus major**
- **Rhomboideus minor**
View 12. Elbow

Biceps brachii (long head)

Biceps brachii (medial head)

Brachialis

Brachioradialis
Muscle Action: Elbow Extension

- Anconeus
- Triceps brachii (long head)
- Triceps brachii (lateral head)
- Triceps brachii (medial head)
Muscle Action: Forearm Pronation

Pronator teres

Pronator quadratus
Muscle Action: Supination
Muscle Action: Wrist Flexion

- Flexor carpi radialis
- Flexor digitorum superficialis
- Flexor carpi ulnaris
- Palmaris longus
Muscle Action: Wrist Abduction

- Flexor carpi radialis
- Extensor carpi radialis longus
- Abductor pollicis longus
- Extensor pollicis longus
- Extensor pollicis brevis
- Extensor carpi radialis brevis
Muscle Action: Wrist Adduction

Flexor carpi ulnaris

Extensor carpi ulnaris
Muscle Action: Wrist Extension

- Extensor carpi ulnaris
- Extensor carpi radialis brevis
- Extensor carpi radialis longus
- Extensor digitorum
Muscle Action: Thumb Extension

- Extensor pollicis longus
- Extensor pollicis brevis
- Abductor pollicis longus
Muscle Action: Thumb Flexion

- Flexor pollicis brevis
- Adductor pollicis
- Palmaris longus
- Flexor pollicis longus
Muscle Action: Hand Digits Opposition

- Flexor pollicis brevis
- Abductor pollicis brevis
- Opponens pollicis
- Opponens digitii minimi
Muscle Action: Hand Digits 2-5 Flexion

- Palmar interossei
- Dorsal interossei
- Lumbricals
Muscle Action: Hand Digits 2-5 Extension

Dorsal interossei

Palmar interossei

Extensor digitorum