Muscles that Move the Superior Appendages

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**Agonist**
A muscle that causes motion.

**Antagonist**
A muscle that can move the joint opposite to the movement produced by the agonist.

**Target**
The primary muscle intended for exercise.

**Synergist**
A muscle that assists another muscle to accomplish a movement.

**Stabilizer**
A muscle that contracts with no significant movement.
**Muscle Attachments**

**Origin** (b): muscle attachment that moves least, generally more proximal.

**Insertion** (a): muscle attachment that moves most, generally more distal.
Abduction: Lateral movement away from the midline of the body
Adduction: Medial movement toward the midline of the body
Circumduction: circular movement (combining flexion, extension, adduction, and abduction) with no shaft rotation
Extension: Straightening the joint resulting in an increase of angle
Eversion: Moving sole of foot away from medial plane
Flexion: Bending the joint resulting in a decrease of angle
Hyperextension: extending the joint beyond anatomical position
Inversion: Moving sole of foot toward medial plane
Pronation: Internal rotation resulting in appendage facing downward
Protrusion: Moving anteriorly (eg: chin out)
Supination: External rotation resulting in appendage facing upward
Retrusion: Moving posteriorly (eg: chin in)
Rotation: Rotary movement around the longitudinal axis of the bone
Muscles that move the shoulder

- Trapezius
- Pectoralis major
- Serratus anterior
- Latissimus dorsi
- Obliquus externus
- Rectus abdominis
• Muscles that move the shoulder are located on the chest and the back.

**Pectoralis minor***. The primary action of this muscle is to draw the scapula anteriorly and downward. This muscle originates on ribs 3-5, and it inserts on the coracoid process of the scapula.

**Serratus anterior**. This muscle is named for its appearance on the chest, which is similar to the edge of a serrated knife. Its primary action is to hold the scapula firmly against the rib cage. This is important when pushing an object or punching.

**Trapezius**. This is a very large muscle, and you should learn three primary actions, depending upon which fibers of the muscle are activated:

1. The superior fibers elevate the scapula;
2. the middle fibers adduct the scapula;
3. the inferior fibers depress the scapula.
Pectoralis minor

- The primary action of this muscle is to **draw the scapula anteriorly and downward**.
- This muscle originates on ribs 3-5, and it inserts on the coracoid process of the scapula.
Pectoralis minor

**Movement**
- Scapula
- Abduction
- Downward Rotation (During Abduction)
- Depression

**Attachments**
- Origin
- Ribs (3rd to 5th)
  - Anterior Surface

**Insertion**
- Scapula (Superior Anterior)
  - Caracoid Process (Medial Border)
Serratus anterior.

- This muscle is named for its appearance on the chest, which is similar to the edge of a serrated knife.
- Its primary action is to **hold the scapula firmly against the rib cage**.
- The Serratus Anterior muscle attaches to the ribs and the shoulder blade. Its main functions are to assist in raising the arm and to expand the ribs while breathing in.
- This is important when **pushing an object or punching**.
Serratus anterior

Movement
• Scapula
• Abduction [1, 2]
• Upward Rotation [2]
• Elevation (Weak) [1]

Attachments
• Origin
• Ribs (Surface) [1, 2]
  – Upper 8 or 9

Insertion
• Scapula (Medial) [1, 2]
  – Medial Border
    • Anterior Surface
Trapezius

- This is a very large muscle, and you should learn three primary actions, depending upon which fibers of the muscle are activated:
  - (1) The superior fibers elevate the scapula;
  - (2) the middle fibers adduct the scapula;
  - (3) the inferior fibers depress the scapula.
Trapezius

- Elevates, retracts and rotates scapula;
- superior fibers elevate,
- middle fibers retract,
- and inferior fibers depress scapula; superior and inferior fibers act together in superior rotation of scapula
Muscles that move the arm

- Muscles that move the arm, like those that move the shoulder, are located on the chest and back.
- The ball-and-socket joint formed by the head of the humerus and glenoid cavity of the scapula allows a wide range of movements.
Muscles that move the arm

• **Pectoralis major.** This muscle flexes the arm. It is commonly exercised by doing “bench presses.”

• **Latissimus dorsi.** This muscle extends the arm. It can be exercised by rowing.

• **Deltoid*.** This muscle abducts the arm. The deltoid originates on the clavicle, and the acromion and spine of the scapula. It inserts on the deltoid tuberosity of the humerus.

• For your information, adduction of the arm is generally accomplished by a combination of the pectoralis major and the latissimus dorsi.
Pectoralis major

- This muscle flexes the arm.
- It is commonly exercised by doing “bench presses.”

Situated at the upper front (anterior) of the chest wall. It makes up the bulk of the chest muscles in the male and lies under the breast in the female. Although impressive looking, this muscle is not particularly strong compared to other less noticeable muscles such as those along the shoulder blade.
Pectoralis major

Adducts and medially rotates humerus; draws scapula anteriorly and inferiorly
Acting alone: clavicular head flexes humerus and sternocostal head extends it
Old right pectoralis major tendon tear
Muscles of the Pectoral Region 1/pectoralis major  2/pectoralis minor 3/subclavius
Latissimus dorsi.

- This muscle extends the arm.
- It can be exercised by rowing.

**Posterior Shoulder Muscles (4)**
- Rhomboideus major
- Latissimus dorsi

**Movement**
- Shoulder
- Adduction
- Extension
- Internal Rotation
- Transverse Extension
- Scapula (Assists) Depression
- Downward Rotation
- Adduction
Latissimus dorsi.
DELTOID

This triangular muscle is the muscle mass of the shoulder. Its origins are the clavicle, acromion process and spine of the scapula. The deltoid inserts on the deltoid tuberosity of the humerus. It is the prime mover of abduction of the arm.
Deltoid*

- This muscle abducts the arm.
- The deltoid originates on the clavicle, and the acromion and spine of the scapula.
- It inserts on the deltoid tuberosity of the humerus.

The **deltoid muscle** is the muscle forming the rounded contour of the human shoulder. Delta (triangle). The deltoid is a frequent site to administer intra-muscular injections.

**Attachments**

**Origin**
Clavicle (Anterior Lateral Third)

**Insertion**
Humerous (Lateral)
Deltoid Tuberosity

**Movement**
Shoulder
Abduction
Flexion
Transverse Flexion
Internal Rotation
Deltoid (Posterior)

**Movement**
- Shoulder
- Extension
- Transverse Extension
- Transverse Abduction
- External Rotation

**Attachments**

**Origin**
- Scapula
- Spine (Inferior edge)

**Insertion**
- Humerus (Lateral)
- Deltoid Tuberosity
Deltoid (Lateral)

**Movement**
- Shoulder
- Abduction
- Flexion
- Transverse Abduction

**Attachments**
- Origin
  - Scapula
  - Acromion (Lateral)

**Insertion**
- Humerus (Lateral)
- Deltoid Tuberosity
Posterior Shoulder Muscles (3)

- M. teres major
- M. triceps brachii (caput longum)

Anatomical diagrams showing the posterior shoulder muscles with labels for specific muscles and anatomical features.
Muscles that move the forearm

- Muscles that flex and extend the forearm are generally located on the arm.
- Muscles that rotate the forearm are located toward the proximal end of the forearm.
Muscles that move the forearm

- **Biceps brachii*. The primary action of this muscle is to flex the forearm. This muscle originates on the coracoid process and the edge of the glenoid cavity, and it inserts onto the radial tuberosity. Notice that this muscle causes movement of the joint between the ulna and the humerus, but it attaches to neither of these bones.

- **Brachialis.** The primary action of this muscle is to flex the forearm.

- **Brachioradialis.** This muscle also flexes the forearm.

- **Triceps brachii*. The primary action of this muscle is to extend the forearm. This muscle has origins on the scapula and posterior shaft of the humerus. It inserts on the olecranon process.

- **Supinator.** The primary action of this muscle is to supinate the forearm.

- **Pronator teres.** The primary action of this muscle is to pronate the forearm.
Biceps brachii

 triarticular biceps brachii muscles

- The primary action of this muscle is to flex the forearm.
- This muscle originates on the coracoid process and the edge of the glenoid cavity, and it inserts onto the radial tuberosity.
- Notice that this muscle causes movement of the joint between the ulna and the humerus, but it attaches to neither of these bones.
Biceps brachii

Movement
Elbow: Flexion [1, 2]
Forearm: Supination [1, 2]
Shoulder: Flexion (Weak) [2]
Transverse Flexion (Weak) [2]

Attachments
Origin
Scapula
Supraglenoid Tuberosity [1]
Coracoid Process [2]

Insertion
Radius
Tubercle [1, 2]
Fascia of forearm
Bicipital Aponeurosis [1, 2]

1/Long Head (Outer)
2/Short Head (Inner)
Brachialis..

• The primary action of this muscle is to flex the forearm

**Movement**
- Elbow Flexion

**Attachments**
- **Origin**
  - Humerous (Anterior)
- **Insertion**
  - Ulna Coronoid Process

Major flexor of forearm -- flexes forearm in all positions
Brachioradialis.

- This muscle also flexes the forearm

**Movement**
- Elbow Flexion

**Attachments**
- Origin
  - Humerous
  - Lateral Condyle

**Insertion**
- Radius (Lateral Distal)
- Styloid Process

**Anterior Forearm Muscles (2)**

- Brachioradialis
- Flexor carpi ulnaris
**BRACHIORADIALIS**

**Description:**
elongated, fusiform muscle along the outer side of the radius

**Origin:**
lateral supracondylar ridge of humerus

**Insertion:**
lateral port of the radius above the styloid process

**Function:**
- flexion of the forearm
- supination of the forearm in when in extension

**Modelization:**
one vector between the humerus and the ulna

**Notes:**
Triceps brachii

Movement

Elbow: Extension [1, 2, 3]

Attachments

Origin
Scapula [1]
Infraglenoid Tubercle
Humerous (Posterior)
Superior to Radial Groove [2]
Inferior to Radial Groove [3]

Insertion
Ulna (Proximal Posterior) [1, 2, 3]
Olecranon Process
Triceps brachii
Supinator/ Pronator teres

- **Supinator.** The primary action of this muscle is to supinate the forearm.

- **Pronator teres.** The primary action of this muscle is to pronate the forearm.
• http://www.exrx.net/Articulations/Scapula.html#anchor71475