

## Muscles & Joint Actions: Shoulder Video Transcript

Welcome to the AFLCA Exercise Theory video series supplementing Chapter 7, Basics of Anatomy. In this video, we're going to cover the muscles of the shoulder and their joint actions. Every muscle and joint action that we discuss is in relation to the concentric phase, the up phase of an exercise against gravity.

Let's start with **shoulder flexion**. From anatomical position, the arm raises in front of the body along a sagittal plane. The agonist (or prime mover) of shoulder flexion is the anterior deltoid, or front head of the deltoid. This makes sense, because the anterior deltoid attaches to the clavicle and humerus bones, crossing the front of the shoulder joint. The muscle generates force and pulls on the bones.

Synergists, or assisting muscles, are the pectoralis major, and the biceps brachii (which is the long head of the biceps muscle).

Now, here's **shoulder extension**. The arm moves back into anatomical position along a sagittal plane. The agonist or prime mover of shoulder extension is the posterior deltoid, or back head of the deltoid. This makes sense, because the posterior deltoid attaches to the scapula and humerus, crossing over the back of the shoulder joint. The muscle generates force and pulls on the bones.

Synergists, or assisting muscles, are the latissimus dorsi, teres major (which is deep to the latissimus dorsi), and the triceps.

That's shoulder flexion and extension. Let's move on.

Here's **shoulder ABDuction**. Remember the midline, the imaginary line that divides the body into right and left sides? From anatomical position, the arm moves away from the midline to the side, along a frontal plane. The agonist (or prime mover) of shoulder abduction is the medial deltoid, or middle head of the deltoid. This makes sense, because the medial deltoid attaches to the scapula and humerus, crossing over the top of the shoulder joint. The muscle generates force and pulls on the bones.

The synergist (or assisting muscle) is the supraspinatus, which is deep to the medial deltoid and is one of the rotator cuff muscles.

Now, **shoulder ADDuction** is the opposite. From the side, the arm moves in toward the midline along a frontal plane. The agonist or prime mover of shoulder adduction is the pectoralis major. This makes sense, because the pectoralis major attaches to the sternum and humerus, crossing over the front of the shoulder joint. The muscle generates force and pulls on the bones.

Synergists, or assisting muscles, are the latissimus dorsi and teres major.

That's shoulder abduction and adduction. Let's move on. This next joint action pair is a bit tricky, because they are not in relation to anatomical position. We're starting with the shoulders flexed.

**Shoulder horizontal abduction.** The arm moves away from the midline, along a horizontal plane. The agonist is the posterior deltoid, or back head of the deltoid.

**Shoulder horizontal adduction** is the opposite. The arm moves in toward the midline, along a horizontal plane. The agonist is the pectoralis major. The synergist is the anterior deltoid.

That's shoulder horizontal abduction and horizontal adduction. We've got one more joint action pair to cover. Shoulder lateral and medial rotation.

**Shoulder lateral rotation.** The arm rotates away from the midline along a transverse plane. The agonist is the infraspinatus, a rotator cuff muscle. The synergist is the teres minor, also a rotator cuff muscle

Finally, **shoulder medial rotation.** The arm rotates in toward the midline along a transverse plane. The agonist is the subscapularis, a rotator cuff muscle. It is deep, deep in the torso, actually on the inside surface of the scapula. Because it crosses the shoulder joint and attaches to the humerus, it pulls on the humerus and causes it to rotate medially.

Synergists are the latissimus dorsi, teres major, and pectoralis major.

Those are the joint actions and muscles of the shoulder. It's a ball-and-socket joint, so it has quite a few joint actions. Practice them, thinking about the context of muscles crossing over the joints and pulling on bones. Then, can you think of exercises that match each of the joint actions?

Thanks for watching.