

Barbell Curl

By Tracy Anderson

Hopefully after reading this article you will have a new understanding of this basic movement. The barbell curl is a staple in most exercise programs, and is easily executed, but is still done incorrectly many times. To complete this exercise grasp the bar with a shoulder width under hand grip. With the elbows to the side, raise the bar until the elbow is fully flexed. Then lower the bar until the arms are fully extended, this is to ensure full range of motion and to stretch the muscle after contraction.

Notice I said until the elbow joint is fully flexed, I said nothing about flexing the shoulder joint. When the elbow is fully flexed, the elbow should not have to travel forward. This would allow the forearm to be perpendicular to the floor and cause a release of tension in the muscles between repetitions. Remember we are working against gravity, so if our forearm is perpendicular, then the tension somewhat releases from the biceps, and goes to the shoulder muscles, specifically the anterior (front) deltoid.

The target muscle is the triarticulate (a muscle that can move three joints) biceps brachii muscle. The biceps muscle is a strong elbow flexor when the radioulnar joint (forearm) is supinated. On the other hand the biceps is also a stronger forearm supinator when the elbow is flexed.

The biceps muscle has two heads the long head (outer) and the short head (inner). Motion of the biceps muscle is elbow flexion, forearm supination, and also is a weak shoulder flexor. The long head originates from the supraglenoid tubercle on the upper edge of the glenoid of the scapula. The short head originates from the coracoid process of the scapula. Both heads combine to form a common muscle belly and then insert on the radial tuberosity of the radius (forearm bone).

The muscles that act as assisting prime movers during this movement are the brachialis and the brachioradialis. The brachialis acts to flex the ulna and the brachioradialis acts to flex the radius. The ulna and radius are the two forearm bones. The brachioradialis is a stronger elbow flexor when the radioulnar joint (forearm) is in neutral position between supination and pronation. When the forearm is pronated, the brachioradialis is more active during elbow flexion since the biceps muscle is in a mechanical disadvantage. Hence the reason for reverse grip curls for the forearm.

During this exercise the two assisting muscles initiate flexion of the elbow. This happens because the biceps muscle inserts just in front of the elbow joint, and is in a weak position because it has no mechanical advantage. As the bar travels upward the biceps muscle accepts more of the load, as its mechanical advantage becomes greater. Around 90 degrees the biceps muscle has its greatest mechanical advantage and is the main muscle producing force. The brachioradialis originates from the lower part of the humerus (upper arm bone) and the brachialis originates from about the middle of the humerus. Because of these origination points, as the bar travels upward their mechanical advantage becomes less, therefore they become less effective at this motion.

Stabilizers of this movement include the anterior deltoid, the upper and middle trapezius, the levator scapula and of course the wrist flexors.

Biceps Tendonitis:

This is inflammation of long head of biceps tendon and usually occurs with rotator cuff inflammation. Clinically, it may be difficult to differentiate the pain patterns of rotator cuff and biceps tendon inflammation. Symptoms indicating of biceps inflammation include pain radiating to biceps, pain with internal rotation of the forearm, and pain with forward flexion of the shoulder joint. Pain over the bicipital groove of the humerus is suggestive of biceps compromise.

A test called the **Yergason test** can test the long head of the biceps tendon stability. Fully flex the elbow and supinate, while someone else externally rotates and presses downward on the flexed elbow. A positive exam will elicit pain.

So the next time you do the simple barbell curl exercise, remember what you have read and everything that happens during that exercise. If you feel you have injured your biceps, or any other muscle, have it professionally diagnosed and treated. This article is for your personal information only.

This article is excerpted from Tracy Anderson's book Movement Science for Personal Trainers. Questions and comments are welcomed and can be given at www.LFNOnline.com.