Analysis of the Standing Triceps Extension

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There are very few sport activities that one could claim do not require the action of the triceps brachii. Indeed, the triceps is the workhorse for most upper extremity throwing and push-pull patterns. Improvement of triceps function through weight training is, therefore, a goal common to athletes in many sports.

Located on the posterior side of the shoulder and upper arm, the triceps brachii has three distinct parts. Though functionally all parts work together to perform shoulder extension and elbow extension, each of the three parts has unique characteristics.

The long head arises from the scapula, is covered in part by the teres muscle group, and its fibers pass distalward (downward) between the two other heads of the muscle to join in the common attachment on the olecranon process of the ulna, at the "point" of the elbow. Because this is the only portion which crosses the shoulder, of the three heads, the long head alone is responsible for extension of the shoulder. The lengthwise pull of the long head also lifts the "ball" or head of the humerus into its socket, the glenoid cavity.

The lateral head arises from the back of the humerus, just below the head of the humerus, and its fibers run straight downward before converging inward toward the common tendinous attachment on the olecranon. Its only action is elbow extension.

The medial head, sometimes called the deep head, arises from the lower two-thirds of the back of the humerus. From this broad attachment, the fibers run straight downward a short distance, then turn obliquely toward the tendinous attachment. The medial head is thought to be the prime mover for elbow extension, though the lateral and long heads assist against resistance.

The triceps acts as a first class lever owing to the attachment of the muscle behind and above the elbow joint. This anatomical arrangement not only allows for great range of motion but for speed of movement as well. As a result of a large number of fibers acting in a mechanically favorable line of pull, the triceps brachii is a powerful extensor of the elbow joint. It is this important action which is developed through the triceps push-down exercise.

Any weight machine equipped with a lat pull-down station lends itself to this exercise. A straight bar or a curl bar is attached to the upper cable. A curl bar has the advantage of comfort because it lessens the tendency for rotation of radius or ulna, especially in the starting position. Nonetheless, a straight bar may be used without compromising the mechanics or the efficiency of lift in strengthening the triceps.

Facing the machine, the athlete grasps the bar with an overhand (pronated) grip, with the hands spread about chest width apart. While the elbows are flexed, the upper arms are brought down to the sides where they shall remain "pinned" throughout the exercise. This is most important for stabilization of the scapula by the long head, and for elimination of substitute motions which prevent isolation of the triceps muscle. The desired movement, then, is elbow extension and flexion only. To increase stability the lifter needs a reasonable base of support, feet spread about shoulder width apart.

Figure 1

Figure 2

Long Head
Lateral Head

Effort
Fulcrum
Resistance
From the starting position of elbow flexion, and shoulder extension, the bar is pushed down slowly until it touches the thighs. Concentration may be required to insure full range of motion in extension, for it is at this point in the exercise that the triceps are least mechanically efficient and substitution of other muscle groups may result. As the bar is brought slowly back to starting position, the triceps contracts eccentrically (lengthening contraction) to control the weight. The triceps push-down involves resistance through the full range of motion, and when executed properly is a very safe and effective means of improving triceps strength.

References

Figure 3.
The triceps is the workhorse for most upper extremity throwing and push-pull patterns.