



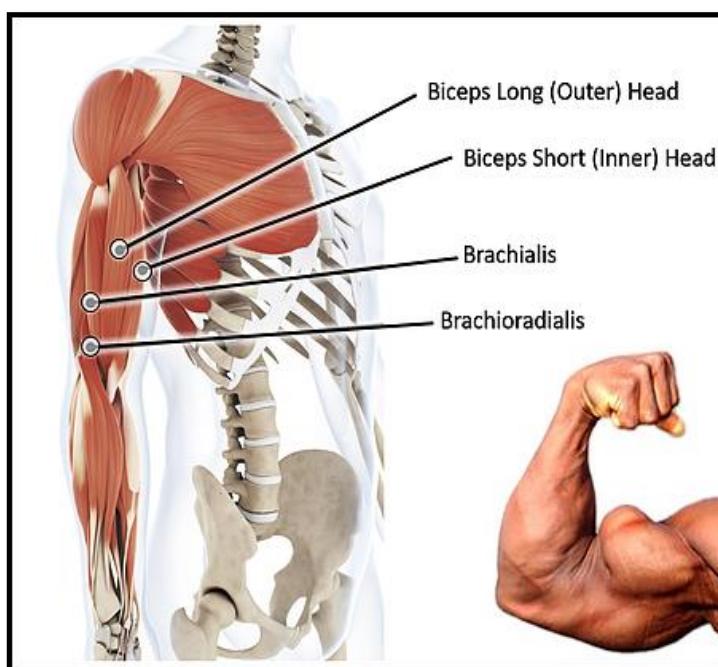
## The Science of Health, Nutrition and Fitness

### Developing Mass and Shape in the Biceps

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There are few 'show piece' muscles that avid bodybuilders attempt to develop more than those of the upper arm. These muscles, termed the 'biceps brachii' are highly sought after by most if not all weight enthusiasts in the quest for physical perfectionism. The following commentary will look at training strategies for the biceps and highlight some key exercises for the most effective development of this 'desired' muscle.

The biceps brachii is located on the anterior aspect of the upper extremity when standing in the anatomical position. When fully developed, the biceps brachii can have a ball like appearance when flexed. Its primary role is to flex the elbow thus drawing the forearm and hand towards the anterior deltoid region of the trunk. The bicep brachii is a two headed muscle. These two heads are termed the short and long heads. The short head of the biceps which lies on the inner aspect of the upper arm arises at the coracoid process of the scapula and has its insertion on the radial tuberosity and the bicipital aponeurosis to the fascia on the medial side of the forearm. The long head is located on the outer aspect of the upper arm lateral to the short head. Its origin is on the supraglenoid tubercle of the scapula and its insertion is also on the radial tuberosity and the bicipital aponeurosis to the fascia on the medial side of the forearm. As has already been identified the biceps are involved in flexion but they also have a role in supination or outward rotation of the arm.



**Anatomy of the Biceps Brachii**

The brachioradialis is a muscle that lies on the lateral side of the forearm and is the predominant agonist in pronation of the lower arm. The brachioradialis also has a significant role in the previously mentioned lower arm supination. When considering effective biceps exercises we must consider this muscle and its pronation and supination roles. For example, this muscle along with the biceps is heavily involved in the 'dumbbell hammer curl'.

One other muscle that will also be of significance when considering biceps based exercises is the brachialis muscle. The brachialis muscle is

synergistic to the biceps brachii and lies underneath the biceps muscle. Its origin is on the distal anterior surface of the humerus and its insertion is on the coronoid process and the tuberosity of the ulna. Its primary function is to assist in flexion at the elbow.

Before we identify and detail exercises and a workout regimen for the biceps brachii and associated elbow flexion muscles; there is one more aspect that must be considered beyond the anatomical characteristics and functionality of this muscle group. That consideration is fibre type; i.e. slow twitch (type I), fast twitch oxidative (type IIa) and fast twitch glycolytic (type IIb). The relative distribution of fibre types in the muscles of elbow flexion are seen in Table 1.

**Table 1: Slow Twitch and fast Twitch Muscle Fibre Distribution**

Biceps – Both Heads, Surface Muscle	Slow Twitch -42.3	Fast Twitch - 57.7
Biceps – Both Heads, Deep Muscle:	Slow Twitch - 50.5	Fast Twitch - 49.5
Brachioradialis:	Slow Twitch - 39.8	Fast Twitch - 60.2

G. T. Yamaguchi *et al* (1990)

This information determines that there is a reasonably balanced relationship between slow twitch and fast twitch fibre distribution in the short and long head of the biceps; both superficially and deep; whereas in the brachioradialis the proportion of fast twitch fibres are greater. Such physiological information allows us to determine repetitions strategies for the designated muscle groups. Muscle fibres are discussed in more depth in other more specific articles.

Before we launch into specific exercises and a bicep routine, let us peruse the foundations that underlie the specific repetition, set and exercise protocols we are going to utilise.

- Fast twitch fibres are larger in cross sectional area than slow twitch fibres and so will be targeted in the weight and repetition strategy as they have a greater 'hypertrophy' potential.
- Fast twitch fibres, specifically the type IIa and type IIb fibres are capable of greater force development than ST fibres. Therefore heavier weight categorisations will stimulate the FT fibres more effectively.
- As the balance of ST and FT fibres is fairly equally distributed, with the exception of the FTb fibres; acute recovery should happen reasonably quickly. Consequently, two minute rest periods will be used to fully stimulate these fibres.
- The brachialis, despite being a deep muscle, adds thickness to the biceps area and can be viewed from a lateral position when the biceps is flexed. It also pushes the biceps brachii upwards forming a 'peak' effect.
- The brachioradialis is most involved in elbow flexion when a reverse grip or neutral grip is used. This muscle adds thickness to the forearm when developed.
- Elbow flexors are 'secondarily' involved in all pulling exercises. Therefore placement of the bicep workout is crucial when considering back workouts and potential limitation of strength in a 'split' routine; or when considering recovery of the biceps.



**Biceps 'Shape' is Largely Determined by Genetic Factors**

## The Exercises

### Exercise 1: Standing Barbell Curl

**Sets:** 4

**Repetitions:** 8 – 10

**Rest:** 2 Mins between Sets

**Weight:** 70 – 80% 1RM

**Muscles:** Biceps Brachii (Short and Long Head), Brachialis

### Exercise 2: Seated Supination Dumbbell Curls

**Sets:** 3

**Repetitions:** 8 - 10 (Each Hand)

**Rest:** 2 Mins between Sets

**Weight:** 70 – 75% 1RM

**Muscles:** Brachioradialis, Biceps Brachii (Short and Long Head), Brachialis

### Exercise 3: Dumbbell Hammer Curls

**Sets:** 3

**Repetitions:** 8 – 10 (Each Hand)

**Rest:** 2 Mins between Sets

**Weight:** 75 – 85% 1RM

Brachioradialis, Biceps Brachii (Long Head)

### Exercise 4: Preacher Bench ‘Peak Contraction’ EZ Curls

**Sets:** 2

**Repetitions:** 6 - 8

**Rest:** 2 Mins between Sets

**Weight:** 65 - 75% 1RM

**Muscles:** Biceps Brachii (Short and Long Head), Brachialis

### Exercise 5: Dumbbell Concentration Curls

**Sets:** 3

**Repetitions:** 8 – 10 (Each Hand)

**Rest:** 2 Mins between Sets

**Weight:** 55 - 65% 1RM

**Muscles:** Biceps Brachii (Short and Long Head), Brachialis

## The Training Splits

This bicep workout can be worked into any body part ‘split’ routine; of course that is down to personal preference. For illustration two potential splits have been provided. The four day split would probably allow a greater intensity of bicep workout as pre-fatigue would not have taken place due to the back workout preceding it, as is the case with the three day split.

### The Four Day Split Routine

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Chest Deltoids	Back Traps	Rest	Quads Hamstrings Calves	<b>Biceps</b> Triceps	Rest	Rest

### The Three Day Split

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Chest Triceps Deltoids	Rest	Back <b>Biceps</b>	Rest	Quads Hamstrings Calves	Rest	Rest

Many other factors are of significance where biceps development is concerned. Technique, speed of repetition, focus on the 'negative – eccentric' aspects of the repetitions, peak contraction and of course nutrition are all important parameters. However, these factors will be discussed in other articles. In the meantime use this routine, train hard, be realistically progressive, not egoistic ... and gains will occur!

### References

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