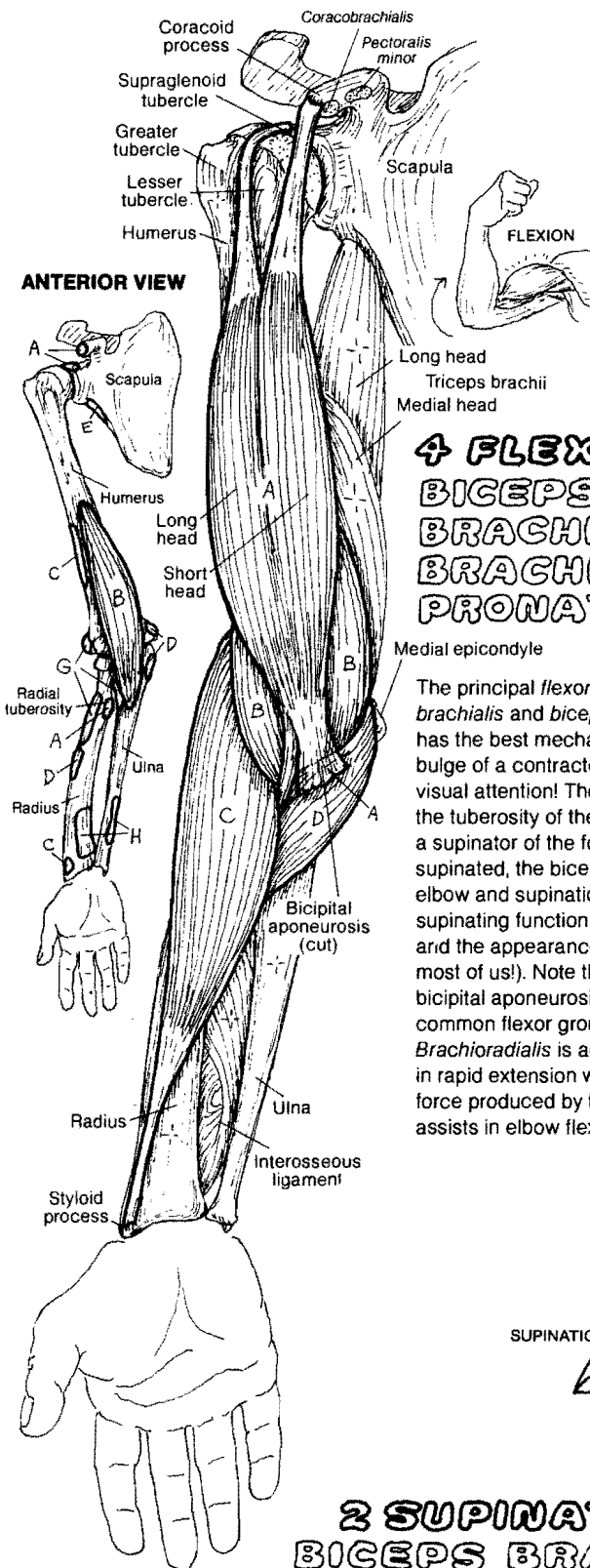


# V. MUSCULAR SYSTEM / UPPER LIMB

## MOVERS OF ELBOW & RADIOULNAR JOINTS

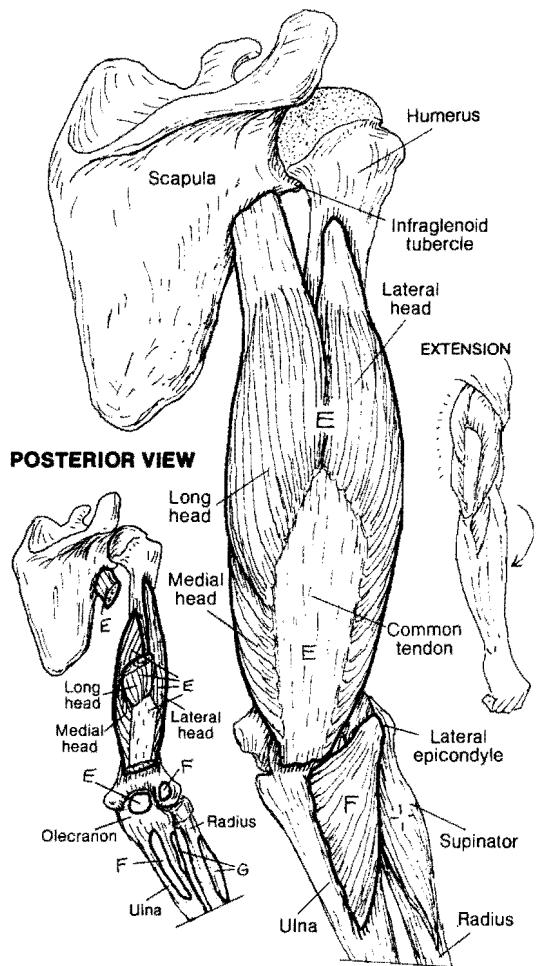


CN: Use the same colors for biceps brachii (A) and triceps brachii (E) as you did for those muscles on Plate 48. (1) Color the four flexors and their attachment sites on the drawings to their left. Do the same for the extensors on the right. (2) Color the supinators and pronators below, the arrows demonstrating their actions, and their attachment sites at upper left.

### 4 FLEXORS:\*

**BICEPS BRACHII<sub>A</sub>**  
**BRACHIALIS<sub>B</sub>**  
**BRACHIORADIALIS<sub>C</sub>**  
**PRONATOR TERES<sub>D</sub>**

The principal flexors of the elbow joint are *brachialis* and *biceps brachii*, of which the former has the best mechanical advantage. Yet it's the bulge of a contracted biceps that gets all the visual attention! The tendon of biceps inserts at the tuberosity of the radius, making the muscle a supinator of the forearm as well. With the limb supinated, the biceps works to fulfill flexion of the elbow and supination of the elbow. Take away the supinating function (flexing the pronated elbow), and the appearance of biceps is disappointing (in most of us!). Note the additional attachment of the bicipital aponeurosis into the deep fascia of the common flexor group (not shown) in the forearm. *Brachioradialis* is active in flexion of the elbow and in rapid extension where it counters the centrifugal force produced by that movement. *Pronator teres* assists in elbow flexion as well as pronation.



### 2 EXTENSORS:\*

**TRICEPS BRACHII<sub>E</sub>**  
**ANCONEUS<sub>F</sub>**

The principal extensor of the elbow joint is the three-headed *triceps brachii* with its massive tendon of insertion. The smaller *anconeus* assists in this function. Triceps is a powerful antagonist to the elbow flexors.

### 2 SUPINATORS:\*

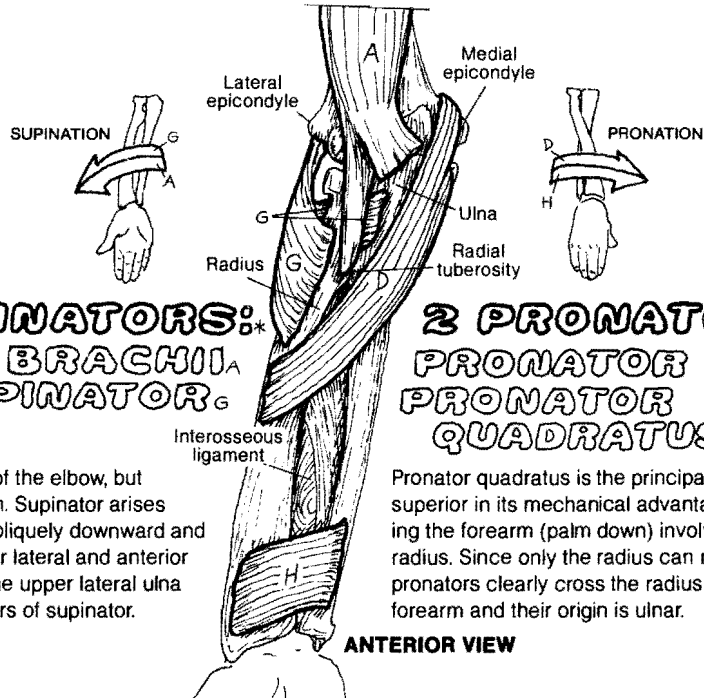
**BICEPS BRACHII<sub>A</sub>**  
**SUPINATOR<sub>G</sub>**

*Biceps brachii* is the more powerful supinator of the elbow, but *supinator* is important in maintaining supination. Supinator arises from the lateral aspect of the elbow, passing obliquely downward and forward to a rather broad insertion on the upper lateral and anterior surface of the radius. A bundle of fibers from the upper lateral ulna passes behind the radius to join the lateral fibers of supinator.

### 2 PRONATORS:\*

**PRONATOR TERES<sub>D</sub>**  
**PRONATOR QUADRATUS<sub>H</sub>**

Pronator quadratus is the principal pronator of the elbow joint, superior in its mechanical advantage to *pronator teres*. Pronating the forearm (palm down) involves medial rotation of the radius. Since only the radius can rotate in the forearm, the pronators clearly cross the radius on the anterior side of the forearm and their origin is ulnar.



ANTERIOR VIEW