

**Table 3**

**UPPER EXTREMITY MUSCLE BALANCING**

<b>Function</b>	<b>Muscle(s) facilitated</b>	<b>Muscle(s) inhibited</b>
Scapular abduction & upward rotation	<i>Serratus anterior</i>	<i>Trapezius (middle fibers), rhomboid major, minor, &amp; trapezius (lower and upper fibers)</i>
Scapular adduction & downward rotation	<i>Trapezius (middle fibers), rhomboid major, minor &amp; trapezius (lower and upper fibers)</i>	<i>Serratus anterior</i>
Scapular elevation	<i>Trapezius (upper fibers), levator scapulae, rhomboid major &amp; minor</i>	<i>Trapezius (lower fibers)</i>
Scapular depression	<i>Trapezius (lower fibers)</i>	<i>Trapezius (upper fibers), levator scapulae, rhomboid major and minor</i>
Shoulder flexion to 90°	Anterior deltoid, <i>coracobrachialis</i> , deltoid (middle fibers), biceps brachii, & pectoralis major (clavicular fibers)	<i>Latissimus dorsi, teres major, teres minor, triceps (long head), &amp; posterior deltoid</i>
Shoulder extension	<i>Latissimus dorsi, teres major, teres minor, triceps (long head), &amp; posterior deltoid</i>	<i>Deltoid (anterior fibers), coracobrachialis, middle deltoid, biceps brachii, &amp; pectoralis major (clavicular fibers)</i>
Shoulder abduction to 90°	<i>Middle Deltoid, Supraspinatus</i> anterior deltoid, posterior deltoid, & serratus anterior (direct action on the scapula)	<i>Pectoralis major &amp; latissimus dorsi</i>
Shoulder horizontal abduction	<i>Posterior Deltoid, infraspinatus &amp; teres major</i>	<i>Pectoralis major &amp; anterior deltoid</i>
Shoulder horizontal adduction	<i>Pectoralis major, &amp; anterior deltoid</i>	<i>Posterior deltoid, infraspinatus &amp; teres major</i>

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*The exercise implied should first be employed in the agonist test position and then in a sitting or standing position; muscles in bold italics are prime movers, all others are accessory muscles.*

Shoulder adduction	<b><i>Pectoralis major &amp; latissimus dorsi</i></b>	<b><i>Middle deltoid, supraspinatus, anterior deltoid, posterior deltoid, &amp; serratus anterior</i></b>
Shoulder external rotation	<b><i>Infraspinatus, teres minor &amp; posterior deltoid</i></b>	<b><i>Subscapularis, pectoralis major, latissimus dorsi, teres major &amp; anterior deltoid</i></b>
Shoulder internal rotation	<b><i>Subscapularis, pectoralis major, latissimus dorsi, teres major &amp; anterior deltoid</i></b>	<b><i>Infraspinatus, teres minor &amp; posterior deltoid</i></b>
Elbow flexion	<b><i>Biceps brachii, brachialis, Brachioradialis, flexor muscles of the forearm (arising from the medial epicondyle of the humerus)</i></b>	<b><i>Triceps, extensor muscles of the forearm (arising from the lateral condyle of the humerus)</i></b>
Elbow extension	<b><i>Triceps, extensor muscles of the forearm (arising from the lateral condyle of the humerus)</i></b>	<b><i>Biceps brachii, brachialis &amp; flexor muscles of the forearm (arising from the medial epicondyle of the humerus)</i></b>
Forearm supination	<b><i>Biceps brachii, Supinator, &amp; brachioradialis,</i></b>	<b><i>Pronator teres, pronator quadratus, flexor carpi radialis</i></b>
Forearm pronation	<b><i>Pronator teres, pronator quadratus, &amp; flexor carpi radialis</i></b>	<b><i>Biceps brachii, supinator &amp; Brachioradialis</i></b>
Wrist extension	<b><i>Extensor carpi radialis, longus, extensor carpi radialis brevis &amp; extensor carpi ulnaris</i></b>	<b><i>Flexor carpi radialis &amp; flexor carpi ulnaris</i></b>
Flexion of the metacarpophalangeal joints of the fingers	<b><i>Lumbicales &amp; dorsa interossei</i></b>	<b><i>Extensor digitorum communis, extensor indicis proprius, &amp; extensor digiti quinti proprius</i></b>
Flexion of the proximal & distal interphalangeal joints of the fingers	<b><i>Flexor digitorum sublimis, flexor digitorum profundus</i></b>	<b><i>Extensor digitorum extensor indicis proprius, extensor digiti quinti proprius</i></b>

Extension of the metacarpophalangeal proximal & distal interphalangeal joints of the fingers	<i>Extensor digitorum communis, extensor indicis proprius, extensor digiti quinti proprius</i>	<i>Flexor digitorum sublimis, flexor digitorum profundus, lumbricales &amp; dorsal interossei</i>
Finger abduction	<i>Dorsal interossei &amp; abductor digiti quinti</i>	<i>Palmar interossei</i>
Finger adduction	<i>Palmar interossei</i>	<i>Dorsal interossei, &amp; abductor digiti quinti</i>
Flexion of the metacarpophalangeal joint of the thumb	<i>Flexor pollicis brevis</i>	<i>Extensor pollicis brevis</i>
Flexion of the interphalangeal joint of the thumb	<i>Flexor pollicis longus</i>	<i>Extensor pollicis longus</i>
Extension of the metacarpophalangeal joint of the thumb	<i>Extensor pollicis brevis</i>	<i>Flexor pollicis brevis</i>
Extension of the interphalangeal joint of the thumb	<i>Extensor pollicis longus</i>	<i>Flexor pollicis longus</i>
Thumb abduction	<i>Abductor pollicis longus, abductor pollicis brevis &amp; palmaris longus</i>	<i>Adductor pollicis obliquus, &amp; transversus</i>
Thumb adduction	<i>Adductor pollicis obliquus &amp; transverses</i>	<i>Abductor pollicis longus, abductor pollicis brevis &amp; Palmaris longus</i>
Opposition of thumb & fifth finger	<i>Opponens pollicis &amp; opponens <u>digiti quinti</u>, abductor pollicis longus &amp; brevis</i>	Adductor pollicis obliquus & transversus