

The *principal movers* of the freely movable **shoulder (glenohumeral) joint** are shown here from three different views. They work in conjunction with the rotator cuff muscles to move the humerus powerfully in lifting, pushing, pulling, and twisting loads. The **deltoid**, characterized by a multipennate form of construction, a broad origin, and a remarkably short lever arm, is a powerful mover of the humerus in flexion, extension, and abduction. The anterior fibers of deltoid adduct the shoulder joint. The clavicular (upper) fibers of the **pectoralis major** are effective in flexing the shoulder joint; the sternal/abdominal (lower) fibers *extend* the *flexed* joint. Both are effective medial rotators as well.

The **teres major**, a muscle of the posterior shoulder, is a major medial rotator of the shoulder joint because its tendon of insertion is on the *anterior* aspect of the humerus; it therefore has an excellent mechanical advantage for this movement. For the same reason, the **latissimus dorsi** is also a medial rotator of the shoulder joint, in addition to being a major extensor of the joint.

Both heads of the **biceps brachii** are active in resisted flexion of the shoulder joint when the forearm is fixed and immobile. Otherwise, its chief function is supination of the forearm (see pages 43 and 55). Note that the biceps brachii has two insertions: one to the radial tuberosity and one to the deep fascia of the forearm by way of an aponeurosis (lacertus fibrosus).

The **coracobrachialis** is a relatively insignificant mover of the shoulder joint in flexion. It does function in shoulder adduction to a modest degree, due to its insertion into the medial border of the humerus. The **long head of the triceps brachii**, arising as it does from the infraglenoid tuberosity of the scapula, is a weak adductor and extensor of the shoulder joint.