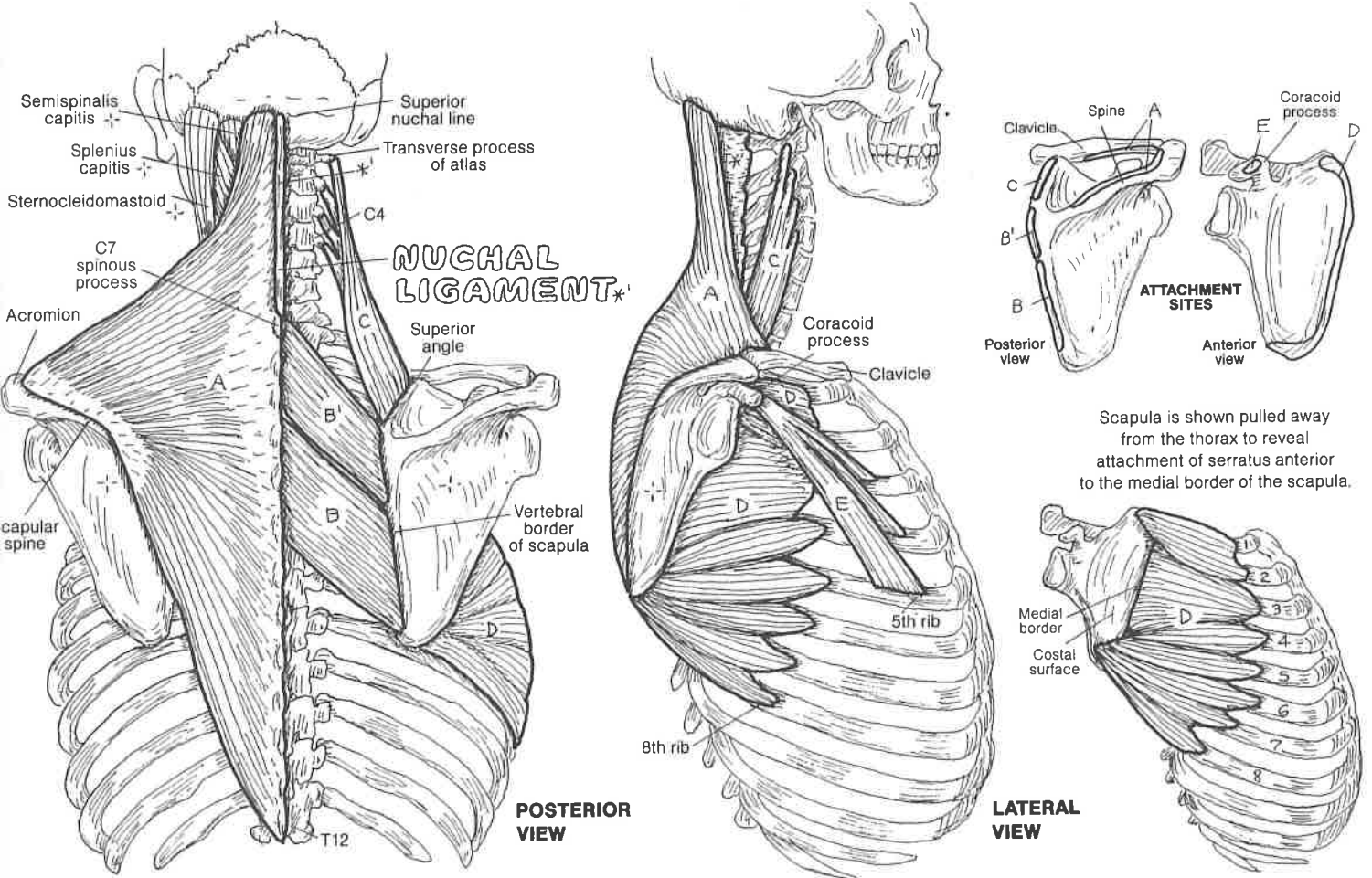


MUSCLES OF SCAPULAR STABILIZATION

TRAPEZIUS<sub>A</sub>, RHOMBOID MAJOR<sub>B</sub>,  
RHOMBOID MINOR<sub>B'</sub>, LEVATOR SCAPULAE,  
SERRATUS ANTERIOR<sub>D</sub>, PECTORALIS MINOR<sub>E</sub>

CN: (1) Color the six muscles of scapular stabilization. Note that the two rhomboids receive the same color (B). In the two main views, color gray the nuchal ligament and its title. (2) Color the attachment site

diagrams at upper right. (3) In the illustrations below describing scapular movement, note that the three regions of trapezius (A) play different roles. Color gray the scapulae, the arrows, and the movement titles.

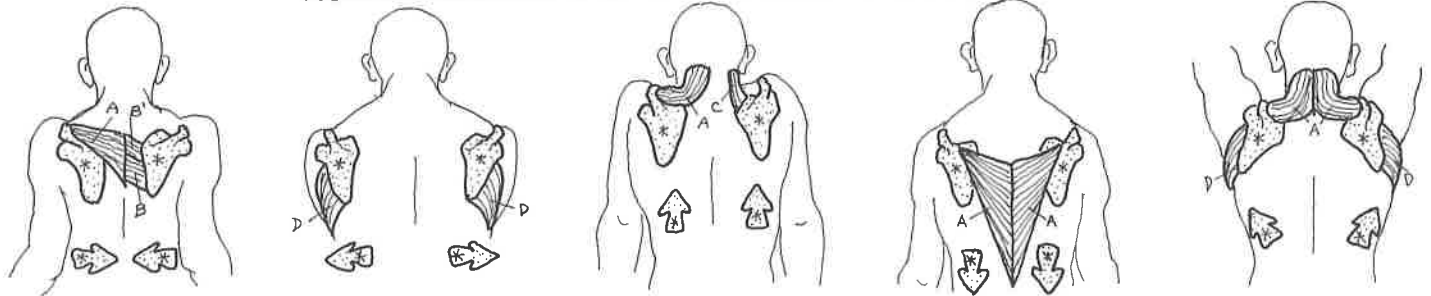


Scapula is shown pulled away from the thorax to reveal attachment of serratus anterior to the medial border of the scapula.

The scapula lies on the posterior thorax, roughly from T 2 to T 8. It has no direct bony attachment with the axial skeleton. Enveloped by muscle, it glides over the fascial-covered thorax during upper limb movement (scapulohoracic motion). Bursae have been reported between the thorax and the scapula; so has bursitis. The scapula is dynamically moored to the axial skeleton by muscles attaching the scapula to the axial skeleton. These *muscles of scapular stabilization* make possible considerable scapular mobility and, therefore, shoulder/arm mobility.

Note the roles of these 6 muscles in scapular movement, and note how the shoulder and arm are affected. *Pectoralis minor* assists *serratus anterior* in protraction of the scapula such as in pushing against a wall; it also helps in depression of the shoulder and downward rotation of the scapula. Consider the power resident in serratus anterior and trapezius in pushing or swinging a bat. Note the especially broad sites of attachment of the *trapezius* muscle. Trapezius commonly manifests significant tension with hard work—mental and physical. A brief massage of this muscle often brings quick relief.

MOVEMENTS OF THE SCAPULA\*



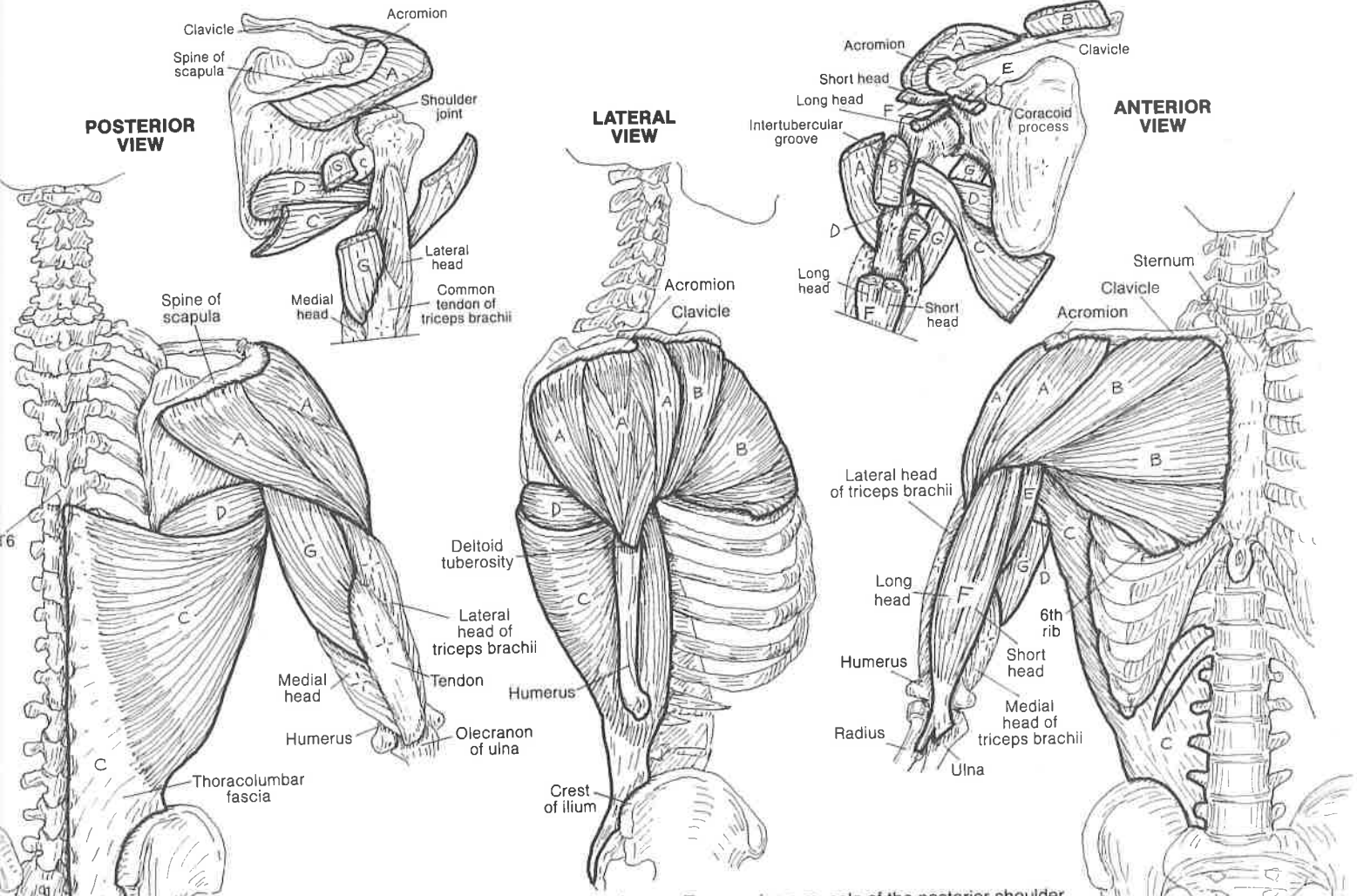
RETRACTION\*    PROTRACTION\*    ELEVATION\*    DEPRESSION\*    UPWARD ROT.\*  
 Military posture ("squaring the shoulders")    Pushing forward with outstretched arms and hands.    Shrugging the shoulders or protecting the head.    Straight arms on parallel bars, holding weight.    Lifting or reaching over head.

# V. MUSCULAR SYSTEM / UPPER LIMB

## MOVERS OF SHOULDER JOINT

DELTOID<sub>A</sub> PECTORALIS MAJOR<sub>B</sub>  
 LATISSIMUS DORSI<sub>C</sub> TERES MAJOR<sub>D</sub>  
 CORACOBRACHIALIS<sub>E</sub> BICEPS BRACHII<sub>F</sub>  
 TRICEPS BRACHII (LONG HEAD)<sub>G</sub>

CN: (1) Begin with both posterior views; note that the biceps and triceps are not shown on the lateral view. (2) When coloring the muscles below, note the actions of different parts of the deltoid (A) and pectoralis major (B).



The principal movers of the freely movable shoulder (glenohumeral) joint, shown here, work in conjunction with the rotator cuff muscles to powerfully move the humerus in lifting, pushing, pulling, and twisting loads. *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 clavicular (upper) fibers of *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.

*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, and therefore has an excellent mechanical advantage for this movement. For the same reason, *latissimus dorsi* is also a medial rotator of the joint in addition to being a major extensor. Both heads of *biceps brachii* are active in resisted flexion. *Coracobrachialis* is not a significant mover in either flexion or adduction, and the *long head of triceps brachii* is not a major mover in extension of the shoulder joint.

## MOVEMENTS OF THE HUMERUS AT THE SHOULDER JOINT\*

