ANATOMY OF AN EXERCISE: ROW
CONCENTRIC & ECCENTRIC PORTION OF THE ROW

CONCENTRIC PORTION OF THE ROW
Pulling the handles of the cable towards the body is considered the concentric portion of the row. During this phase, the prime movers and synergists are shortening to generate force to overcome the load of the weight stack (force acceleration). The motions that occur during this phase include shoulder extension/abduction/external rotation, elbow flexion, and scapular retraction and depression.

At the glenohumeral joint, the latissimus dorsi acts as the prime mover and pulls the humerus into shoulder extension while the teres major and posterior deltoid act as synergists of the movement and the posterior deltoid assists in synergistic abduction and external rotation. The rotator cuff musculature provides dynamic stability of the glenohumeral joint by compressing the humeral head against the glenoid fossa, allowing for optimal joint articulation through the motion.1

At the scapulothoracic joint, the rhomboids and middle and lower trapezius work synergistically as a force couple to accelerate scapular retraction and depression while the humerus moves into extension. The latissimus dorsi also has fibers which attach to the inferior angle of the scapulae and assists in scapular depression and retraction as it performs glenohumeral extension.2

At the elbow joint, the bicep brachii acts as the prime mover of elbow flexion with concomitant shoulder extension, and the brachioradialis and brachialis musculature acts as synergist to elbow flexion. The biceps brachii and brachialis also provide an upward compressive force of the radius and ulna while the brachioradialis provides a force opposite that of the cable, all of which enhances elbow stability through the motion. Due to the attachment of the bicep brachii to the scapulae, that structure also provides a small degree of stability to the glenohumeral joint.2

At the lumbo-pelvic-hip complex, the stabilization mechanism of the core (transverses abdominis, multifidi, internal obliques and transversospinalis) isometrically stabilizes the complex. Performing the rowing exercise standing allows for better recruitment of the gluteus maximus, contributing to stability of the pelvis and spine. The latissimus dorsi also has attachments at the lumbar spine and pelvis via the thoracolumbar fascia. As it shortens to produce shoulder extension, scapular retraction and depression also create tension to the thoracolumbar fascia and, along with the gluteus maximus and transverse abdominus (all of which have attachments to the thoracolumbar fascia), create a force-closure stabilization force at the sacroiliac joints, thus enhancing trunk stability.3
At the cervical spine, the deep cervical flexors also work isometrically to stabilize this region of the spine. This decreases stresses placed upon the cervical structures and allows for proper arthrokinematics to occur at the sternoclavicular and acromioclavicular joints.²

**ECCENTRIC PORTION OF THE ROW**

The return to the starting position (shoulder flexion and elbow extension) is the eccentric component of the row. The muscles involved in concentrically accelerating the load must now decelerate the load against gravity back to the starting position. This is a very important component of the exercise, as many individuals do not possess appropriate eccentric deceleration strength.³

At the glenohumeral joint, the latissimus dorsi, along with the teres major, must decelerate shoulder flexion and external rotation. The rotator cuff musculature continues to play an important role in dynamically stabilizing the glenohumeral joint through the eccentric portion.¹

At the scapulothoracic joint, the rhomboids and middle and lower trapezius now eccentrically decelerate scapular protraction and elevation along with the latissimus dorsi.¹ It is important to avoid spinal flexion while controlling eccentric protraction and elevation. The spine should maintain a neutral position in order to decrease stresses placed upon spinal structures.⁴

At the elbow joint, the bicep brachii, brachialis, and brachioradialis work eccentrically to decelerate elbow extension.

At the lumbo-pelvic-hip complex and cervical spine, the stabilization mechanism of the core, the gluteus maximus, and the deep cervical flexors should continue to isometrically stabilize both regions of the body's structure.

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