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## **Scapular Stabilizing Muscles: Rehabilitation Protocol**

### **Considerations**

- *Why is the scapula important?* Normal shoulder motion involves a coordinated rhythm between movement of the shoulder blade on the chest wall and movement of the ball in the shoulder socket. This is called the "scapulohumeral rhythm." Because the shoulder socket is part of the scapula, many conditions involving the shoulder joint cause secondary problems related to scapular motion and position. These secondary problems can, in turn, worsen the primary condition.

- *What is scapular dyskinesia?:* This term refers to abnormalities in the rhythm of movement between the shoulder blade and ball and socket joint. It often goes unrecognized in the treatment of shoulder conditions such as impingement syndrome, rotator cuff tendinosis and shoulder instability. It may result from fatigue of the shoulder girdle muscles, pain-mediated muscle inhibition or stiffness about the shoulder joint.

- *Why is scapular dyskinesia important?:* The scapula functions to provide a stable foundation through which energy can be transferred from the legs and trunk to the arm and hand. This linkage is called the kinetic chain. Scapular dyskinesia may result in ineffective energy transfer, placing added stress on the tissues around the shoulder which must compensate for a weak link in the chain. This added stress may result in further muscle fatigue and tissue injury about the shoulder. Restoring a stable scapular base is essential to rehabilitating the shoulder and returning to functional activities.

The position and movement of the scapula on the chest also controls the orientation of the shoulder socket relative to the ball and the orientation of the acromion bone relative to the rotator cuff tendons. Any abnormality of the scapular position therefore results in secondary effects on the function of the shoulder joint. For instance, if the scapula tilts anteriorly and laterally, the space available for the rotator cuff may be narrowed, resulting in tendon abrasion and injury.

- *What is scapular stabilization?:* Scapular stabilization refers to a set of exercises that strengthen the shoulder girdle muscles to restore normal scapular motion and correct dyskinesia. These exercises also aim to facilitate energy transfer through the kinetic chain. An essential part of rehabilitating the kinetic chain therefore involves exercises that transfer energy from the trunk to the arm.

- *Which muscles are involved in scapular stabilization?:* The two most important muscles are the trapezius and serratus anterior because these have the most influence on the position and movement of the scapula. Other important muscles include the rhomboid major, rhomboid minor, levator scapulae and latissimus dorsi. Exercises which strengthen these muscles should be combined with exercises to strengthen the rotator cuff as cuff fatigue may lead to secondary scapular dyskinesia.

### **General Guidelines**

- Early rehabilitation should aim to improve the endurance and strength of the scapular stabilizing muscles. Low weight, high repetition exercises promote muscle hypertrophy and improve fatigue resistance. Once more normal scapular mechanics have been restored, higher weights with lower repetitions may be used to promote power.
- Rotator cuff strengthening can begin once a stable scapular base has been restored
- Once endurance and strength have improved, exercises that promote effective energy transfer through the kinetic chain should be added
- If you are working with a physical therapist, they may institute a special set of exercises called Proprioceptive Neuromuscular Facilitation that help promote normal scapulohumeral rhythm and improve the body's ability to position the scapula for stable energy transfer during functional activities.

### **Phase 1: Muscle Strengthening and Conditioning (0-3 weeks)**

#### **Principles**

- Avoid exercises that cause pain
- Use ice following exercise to alleviate inflammation and swelling

**Range of Motion** stretches should be done 3-5 times per day. Each stretch should be held for 10-15 seconds and repeated 3 times

- Cross body adduction: below neck level, at neck level, above neck level
- Sleeper stretch
- Roll-over sleeper stretch
- Internal rotation in abduction doorway stretch
- Towel roll and corner stretch for pectoralis minor
- Core body flexibility

**Scapular Stabilizer Strengthening** with rubber tubing or light resistance with dumbbells or machines

- Isometric scapular retraction and depression
- Shoulder shrugs
- Prone rowing or bench rows
- Seated rows with scapular pinch
- Low row
- Push-ups with a plus: wall, table-top, floor
- Bench with a plus
- Chair press-ups
- Sitting or standing flys
- Lat pull downs

**Scapular Positioning**

- Closed chain scapular clocks with hand stabilized on wall at 90° abduction
  - Protraction/retraction
  - Elevation/depression
- Closed chain axial load ball rolls in varying degrees of abduction
  - Start low and work to horizontal
- Scapular punches with light weights

**Phase 2:** (3-8 weeks)

- Continue posterior capsule and anterior chest wall stretching
- Continue maintenance shoulder girdle strengthening with progressive increase in weights as endurance improves
- Begin upper body ergometers beginning at low resistance and height below 90° and slowly progress to height at 140° flexion

**Rotator Cuff Strengthening** with rubber tubing or lightweight dumbbell, perform 20-30 repetitions and do 2-3 sets of each

- Sidelying internal and external rotation
- Internal and external rotation at 0° and at 90° abduction
- Abduction to 90°
- Scapular plane elevation: empty can and full can
- Prone horizontal abduction in neutral rotation and external rotation
- Prone horizontal scapular plane elevation in neutral and external rotation
- Prone external rotation
- D2 flexion and extension

**Scapular Stabilization**

- Closed chain scapular clocks
- Closed chain axial load ball roll
  - Start at low angles such as table top and progress to horizontal abduction on wall
  - Include humeral head depressions
- Wall wash with axial load at varying degrees of abduction
  - Start with vertical and progress to diagonal
- Scapular punches
- Shoulder diagonal punches and dumps combined with scapular retraction
  - Start with vertical and progress to diagonal
- Plyoball chest pass and overhand toss
- PNF exercises

**Phase 3:** Return to Functional Activities

- Maintenance strengthening with increased weights
- Maintenance flexibility
- Continue UBE with increasing resistance
  - Especially reverse direction to work scapular girdle muscles
- Sport or work specific rehabilitation