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Rehab Exercise Prescription Sequencing for Shoulder External Rotators

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Column Editor

summary

Overhead athletes are susceptible to shoulder injuries. One component of a complete rehabilitation program is a systematic exercise prescription for the shoulder's external rotators. An overhead athlete should be progressed from basic rehab exercise positions to dynamic, sport-specific positions prior to returning to sport.

Injuries to the shoulder are common in athletes who engage in repetitive overhead motions. Shoulder rehabilitation programs traditionally emphasize strengthening the rotator cuff. The rotator cuff is comprised of 4 muscles: the supraspinatus, infraspinatus, teres minor, and subscapularis. These 4 muscles provide biomechanical control to the glenohumeral joint, steering and stabilizing the humerus on the glenoid.

We often observe weakness in the shoulder's external rotators, the infraspinatus

and teres minor. Deficient strength in these muscles affects athletic performance and contributes to shoulder pathology. Classic electromyographic research has provided rehabilitation professionals with a foundation for exercise prescription (2). Understanding the functional kinesiology of these 2 muscles will help the rehabilitation specialist devise a progressive and safe program to return the athlete to sport. This article will describe a sport-specific rehabilitation progression for the external rotators.

Role of the External Rotators in Overhead Motions

Sports medicine researchers have identified dual roles for the external rotators (ER) (1). When the arm is in the *cocking* phase (elevated into abduction and external rotation), the ER muscles contract concentrically. During the *throwing* phase (or forward arm swing in volleyball), the ER muscles contract eccentrically, withstanding significant force (1). It is during the throwing phase

that eccentric overloading occurs, potentially leading to injury.

Concentric Training

Townsend et al. (2) found the top exercise for the infraspinatus to be horizontal abduction with external rotation and for the teres minor to be side-lying external rotation (2). From our clinical experience, we first prescribe either standing external rotation using elastic tubing (Figure 1) or side-lying external rotation (Figure 2). Most patients can safely perform either exercise and quickly master the technique. As soon as possible, we add the horizontal abduction with external rotation (Figure 3) exercise into the program. The athlete should initially perform each exercise with low weight, completing 1–2 sets of 25–30 repetitions. As the athlete can successfully complete 25–30 repetitions with no joint pain, gradually increase weights by 1-lb increments (Table 1).



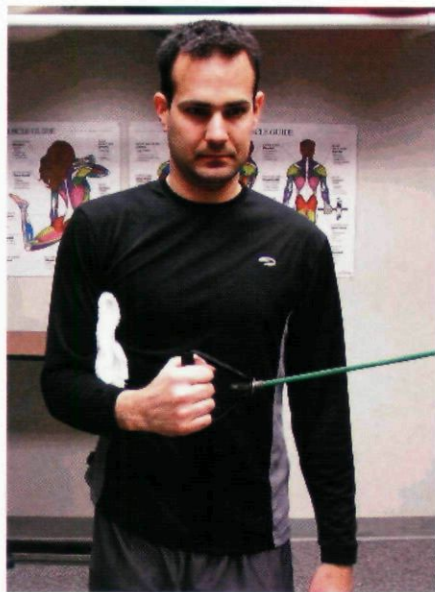


Figure 1. Standing shoulder external rotation.

As strength increases, concentric training must be progressed with the arm in elevated positions. Start by positioning the shoulder in neutral rotation, at 90° of shoulder abduction and 90° of elbow flexion. Perform the exercise by externally rotating the shoulder to 90° (Figure 4).

Eccentric Training

It is during the eccentric loading phases that the shoulder is most often injured. To train the shoulder eccentrically, the athlete assumes the same position as in Figure 4. First, the athlete externally rotates the shoulder to 90°. In this 90-90 position, the athlete takes 1 step backward while maintaining the 90-90 position. The athlete then allows the shoulder to internally rotate, controlling the speed of the motion (Figure 5). The athlete then returns to the starting position and repeats. Plyometric training should gradually be incorporated to increase eccentric capacity. We recommend 2 exercises: the backward catch and throw and the 1-handed baseball throw. The backward catch and throw exercise will position the athlete on his or her knees, with the injured shoulder both abducted and externally rotated to 90° and the elbow

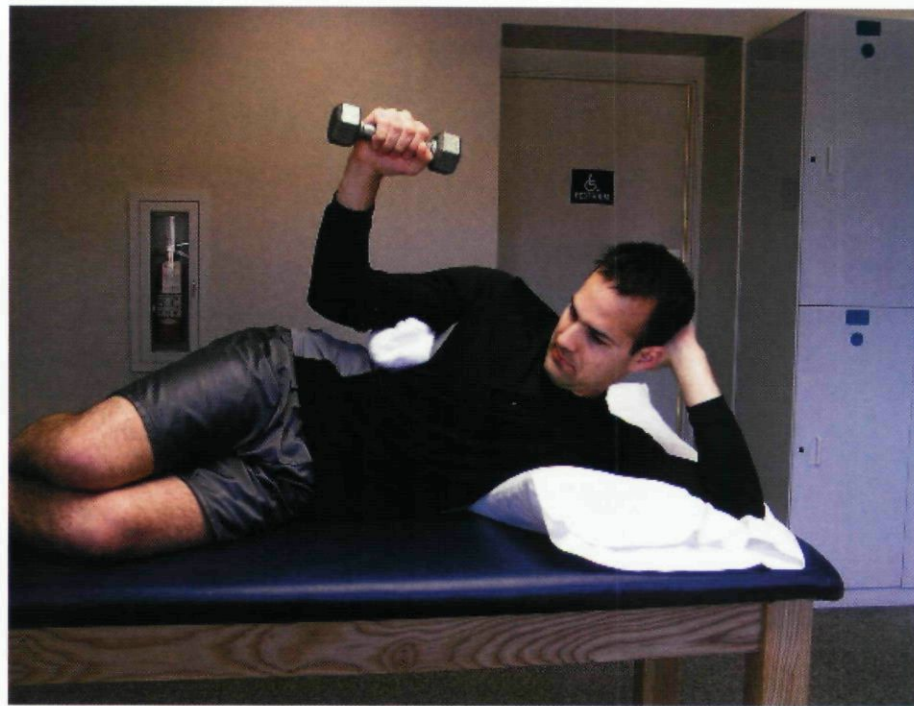


Figure 2. Side-lying external rotation.



Figure 3. Horizontal abduction with external rotation.

flexed to 90°. The rehab professional, standing behind the patient, tosses a weighted ball anterior and medial to the

athlete's hand. The catching of the ball requires the athlete to decelerate the ball and then explosively reverse directions,



Figure 4. Shoulder external rotation (ER) 90-90.

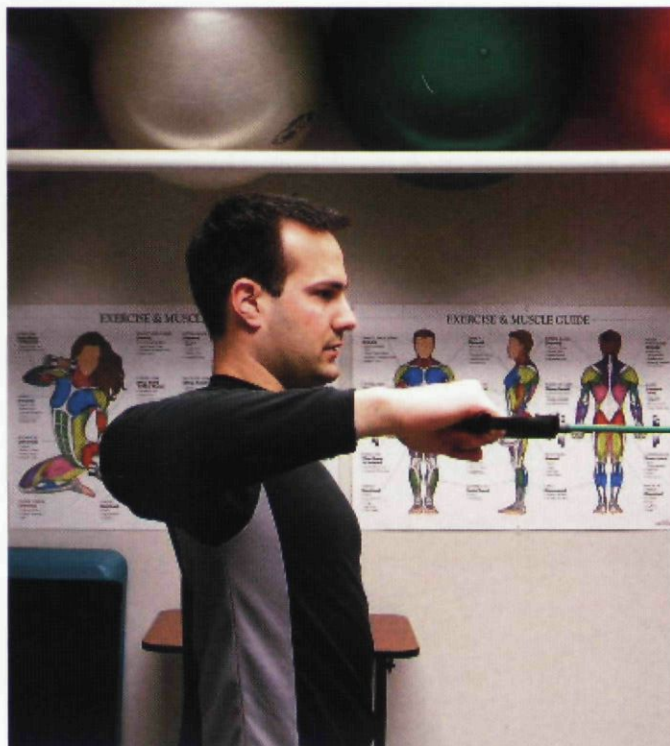


Figure 5. Shoulder external rotation (ER) 90-90.

Table 1
Rehab Exercise Prescription Sequence for Shoulder External Rotators

Initial Treatments (Visit 1-2)

Standing ER with elastic tubing	1-2 sets		25-30 reps
Side-lying ER	1-2 sets	0 lbs	25-30 reps
Horizontal abduction with ER	1-2 sets	0 lbs	25-30 reps
Increase to light hand weights as able			

Overhead Progression Sequence (Progress as Tolerated)

90-90 shoulder ER (concentric)	1-2 sets		25-30 reps
90-90 shoulder ER (eccentric)	1-2 sets		25-30 reps
Plyometric training:	1-2 sets		5-8 reps
Backward catch and throw			
Use light plyoball			
One-handed baseball throw			
Use light plyoball and rebounder			

ER = external rotation.

throwing the ball back to the rehab professional. The 1-handed baseball throw is performed using a light plyoball and a rebounder. The athlete stands facing a rebounder with the arm in a 90-90 position. The ball is thrown toward the rebounder and caught with the same

hand. Both exercises reproduce functional sports situations.

Conclusion

A complete rehabilitation program for an athlete with a shoulder injury includes strength testing and exercise prescription

for all of the glenohumeral and scapular muscles. The program presented here provides a framework for rehabilitation exercise prescription of the shoulder's external rotators for overhead athletes. ♦

References

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