

Rehabilitation Guidelines for Posterior Shoulder Reconstruction with or without Labral Repair

The anatomic configuration of the shoulder joint (glenohumeral joint) is often compared to a golf ball on a tee. This is because the articular surface of the round humeral head is approximately four times greater than that of the relatively flat shoulder blade face (glenoid fossa).¹ The stability and movement of the shoulder is controlled by the rotator cuff muscles, ligaments, and the capsulolabral complex of the shoulder (Figure 1). The labrum is a fibrocartilagenous ring, which attaches to the bony rim of the glenoid fossa.¹ The labrum doubles the depth of the glenoid fossa to help provide stability. An analogy includes a parked car on a hillside with a chop block under the tire such that the round tire is the humeral head, the road is the glenoid fossa and the chop block is the labrum.

The anatomy of the shoulder allows for great mobility, yet this anatomical structure also sacrifices stability. The shoulder is one of the most commonly dislocated joints in the body. Shoulder dislocations can occur from trauma or from hyper-laxity (genetic or acquired looseness of the capsule and ligaments).

Traumatic posterior shoulder dislocations most often occur

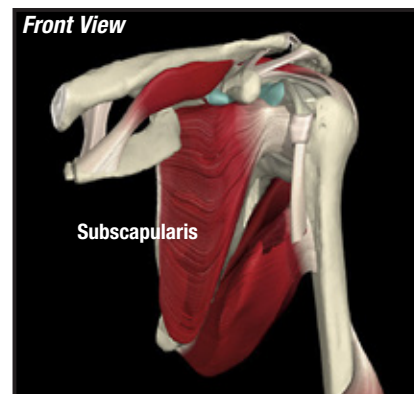
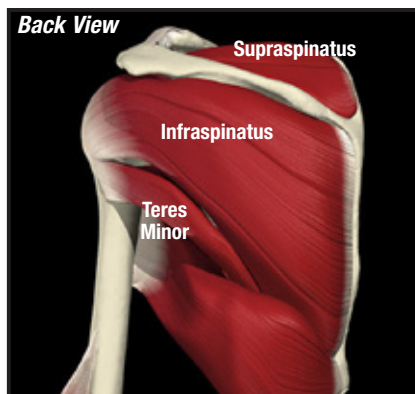


Figure 1 Rotator cuff anatomy

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when significant force is placed through the arm when it is front of the body (Figure 2). When the shoulder dislocates posteriorly the capsule, ligaments and labrum often tear (Figure 3). Shoulder dislocations often lead to recurrent dislocation or subluxation, and posterior shoulder instability occurs when the humeral head subluxes or dislocates posteriorly on the glenoid. Sport activities that lead to posterior shoulder instability include heavy bench pressing and football linemen blocking—again with that mechanism of the arm straight out in front of the chest with force being applied through the arm to the shoulder.

For some athletes posterior instability can be treated non-operatively with rehabilitation.

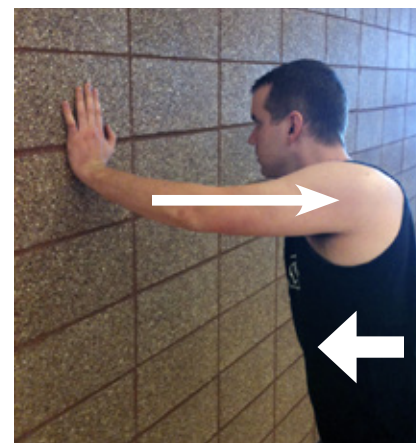


Figure 2 Common mechanism of injury for posterior instability, arm straight out from chest with the body moving forward and a backward (posterior) force applied to the shoulder through the arm.

This often involves strengthening the rotator cuff and scapular muscles as well as improving the body's neuromuscular reaction to sudden changes of position

or movement. Altering sport-specific techniques also is used in combination with rehabilitation. When these approaches are unsuccessful and posterior instability continues, the athlete may be left with the option of changing sports or having surgery. Surgical correction for posterior instability consists of capsulolabral repair and addressing the labral injury. This may mean debriding or removing frayed portions of the labrum or repairing tears with suture materials (Figure 4).

After surgery, rehabilitation plays

a crucial role in maximizing the individual's functional outcome. In the early phases of rehabilitation after surgery it is necessary to protect the surgical repair to allow healing. This is done by allowing the patient to only move the shoulder in to certain ranges of motion and wear a sling most of the time that they are not doing rehabilitation exercises. The range of motion restrictions are outlined in Phase I. The rehabilitation guidelines are presented in a criterion based progression. General time frames are given for reference to the average, but

individual patients will progress at different rates depending on their age, associated injuries, pre-injury health status, rehabilitation compliance and injury severity. Specific time frames, restrictions and precautions may also be given to protect healing tissues and the surgical repair/reconstruction.

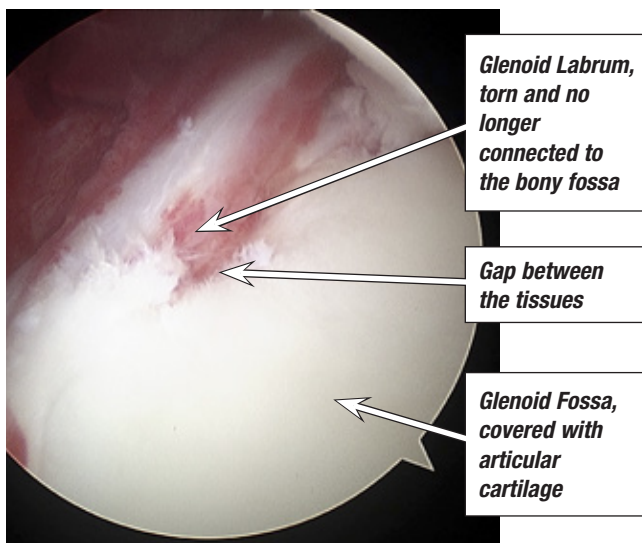


Figure 3 Posterior labral tear

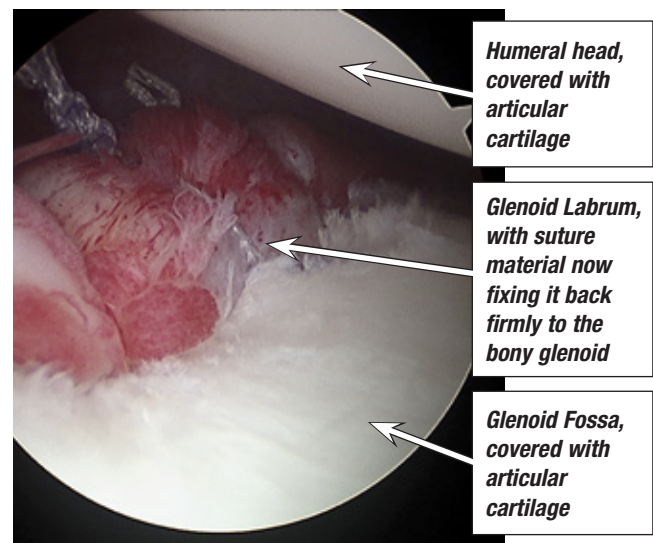


Figure 4 Posterior labral repair

PHASE I (surgery to 3 weeks after surgery)

Appointments	<ul style="list-style-type: none"> • Rehabilitation appointments begin at 7-14 days after surgery
Rehabilitation Goals	<ul style="list-style-type: none"> • Protection of the post-surgical shoulder • Activation of the stabilizing muscles of the gleno-humeral and scapulo-thoracic joints • Maintain range of motion (ROM) at the elbow and wrist
Precautions	<ul style="list-style-type: none"> • Sling immobilization required for soft tissue healing for 6 weeks after surgery; remove the sling during post-operative week 6 in safe environments and discontinue 6 weeks after surgery • Hypersensitivity in axillary nerve distribution is a common occurrence • No shoulder internal rotation past neutral for 6 weeks after surgery and no shoulder internal rotation with abduction for 8 weeks after surgery to protect repaired tissues
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> • Begin at post-operative week 3, including sub-maximal shoulder isometrics for shoulder internal rotation and external rotation; flexion and extension; abduction and adduction • Passive ROM for shoulder elevation in the sagittal and frontal plane as well as shoulder external rotation to 40° in neutral • Hand gripping • Elbow, forearm, and wrist Active ROM • Cervical spine and scapular Active ROM • Desensitization techniques for axillary nerve distribution • Postural exercises
Cardiovascular Exercise	<ul style="list-style-type: none"> • Walking and stationary bike with the sling on; avoid running and jumping due to the distractive forces that can occur at landing • No treadmill
Progression Criteria	<ul style="list-style-type: none"> • 3 weeks post-operative

PHASE II (begin after meeting Phase I criteria, usually 3-8 weeks after surgery)

Appointments	<ul style="list-style-type: none"> • Rehabilitation appointments are 1-2 times per week
Rehabilitation Goals	<ul style="list-style-type: none"> • Full Active ROM in all cardinal planes, except shoulder internal rotation • Progress shoulder internal rotation ROM gradually to prevent oversteering the repaired posterior tissues of the shoulder • Strengthen shoulder and scapular stabilizers in protected position (0°– 45° shoulder abduction) • Begin proprioceptive and dynamic neuromuscular control retraining, making sure to avoid closed chain exercises due to stress to posterior repair
Precautions	<ul style="list-style-type: none"> • Sling immobilization required for soft tissue healing for 6 weeks after surgery Remove sling during the post-operative week 6 in safe environments and discontinue after 6 weeks after surgery • Hypersensitivity in axillary nerve distribution is a common occurrence • No shoulder internal rotation past neutral for 6 weeks after surgery and no shoulder internal rotation with abduction for 8 weeks after surgery to protect repaired tissues • Avoid passive and forceful movements into shoulder internal rotation and horizontal adduction
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> • Active assistive and active ROM in all cardinal planes, making sure to assess scapular rhythm and respect shoulder internal rotation ROM guidelines • Rotator cuff strengthening in non-provocative positions (0° - 45° shoulder abduction) • Scapular strengthening and dynamic neuromuscular control • Cervical spine and scapular active ROM • Postural exercises • Core strengthening
Cardiovascular Exercise	<ul style="list-style-type: none"> • Walking, stationary bike, Stairmaster • No swimming or treadmill • Avoid running and jumping until the athlete is at least 8 weeks after surgery and has full rotator cuff strength in a neutral position due to the distractive forces that can occur at landing
Progression Criteria	<ul style="list-style-type: none"> • Full Active ROM, except shoulder internal rotation • Normal (5/5) shoulder internal rotation and external rotation strength at 45° shoulder abduction

PHASE III (begin after meeting Phase II criteria, usually 8 weeks after surgery)

Appointments	<ul style="list-style-type: none"> • Rehabilitation appointments are once every 2-3 weeks
Rehabilitation Goals	<ul style="list-style-type: none"> • Full shoulder active ROM in all cardinal planes with normal scapulo-humeral movement • Normal (5/5) rotator cuff strength at 90° shoulder abduction in the scapular plane • Normal (5/5) peri-scapular strength
Precautions	<ul style="list-style-type: none"> • Avoid posterior pain with activity and rehabilitation; post-activity soreness should be mild and subside within 24 hours • All exercises and activities remain non-provocative and low to medium velocity • Avoid activities where there is a higher risk for falling or outside forces to be applied to the arm • No swimming, throwing or sports
Suggested Therapeutic Exercise	<p>Motion</p> <ul style="list-style-type: none"> • No restrictions for shoulder internal rotation, which may be normalized to the other side gradually and with appropriate end feel; keep in mind that regaining internal rotation should be done gradually through active ROM and with appropriate joint position and stability <p>Strength and Stabilization</p> <ul style="list-style-type: none"> • Shoulder flexion in prone; horizontal abduction in prone; full can exercise; D1 and D2 diagonals in standing without exceeding 90° shoulder abduction • Resistive tubing, cable column, and dumbbell exercise with light resistance and high repetitions with shoulder internal rotation and external rotation performed with the shoulder not exceeding 90° of shoulder abduction; rowing is ok
Cardiovascular Exercise	<ul style="list-style-type: none"> • Walking, biking, and Stairmaster are ok if Phase II criteria has been met • No swimming and no running
Progression Criteria	<ul style="list-style-type: none"> • Patient may progress to Phase IV if they have met the above stated goals and are at least 12 weeks post-surgery

PHASE IV (begin after meeting Phase III criteria, about 12 weeks after surgery)

Appointments	<ul style="list-style-type: none"> • Rehabilitation are once every 2-4 weeks
Rehabilitation Goals	<ul style="list-style-type: none"> • Patient to demonstrate shoulder stability with higher velocity movements and change of direction movements • Normal (5/5) rotator cuff strength with multiple repetition testing at 90° of shoulder abduction in the scapular plane • Full multi-plane Active ROM
Precautions	<ul style="list-style-type: none"> • Avoid posterior shoulder pain with activity and rehabilitation; post-activity soreness should be mild and subside within 24 hours • Progress gradually into provocative exercises by beginning with low velocity, known movement patterns • Progress gradually into closed chain exercises focusing on ability to control posterior forces
Suggested Therapeutic Exercise	<p>Strength and Stabilization</p> <ul style="list-style-type: none"> • Dumbbell and medicine ball exercises that incorporate trunk rotation and control with rotator cuff strengthening at 90° of shoulder abduction; begin working towards more functional activities by emphasizing core and hip strength and control with shoulder exercises • Resistive tubing, cable column, and dumbbell exercises with shoulder internal rotation and external rotation in 90° of shoulder abduction; rowing is ok • Balance board in push-up position (with RS); prone swiss ball; walk-outs; rapid alternating movements in supine D2 diagonal; closed kinetic chain stabilization with narrow base of support • Begin education in sport specific biomechanics with very gradual and progressive program for throwing, swimming or overhead racquet sports
Cardiovascular Exercise	<ul style="list-style-type: none"> • Walking, biking, stairmaster and running are ok if the patient has met all Phase III criteria • No swimming
Progression Criteria	<ul style="list-style-type: none"> • Patient may progress to Phase V if they have met the above stated goals and have no shoulder apprehension or impingement signs

PHASE V (begin after meeting Phase IV criteria, usually about 18 weeks after surgery)

Appointments	<ul style="list-style-type: none"> Rehabilitation appointments are once every 2 -4 weeks
Rehabilitation Goals	<ul style="list-style-type: none"> Patient to demonstrate shoulder stability with higher velocity movements and change of direction movements that replicate sport specific patterns, including swimming, throwing, etc. No shoulder apprehension or instability with high velocity overhead movements Improve core and hip strength and mobility to eliminate any compensatory stresses to the shoulder Work capacity cardiovascular endurance for specific sport or work demands
Precautions	<ul style="list-style-type: none"> Progress gradually into sport specific movement patterns Avoid posterior shoulder pain with activity and rehabilitation; post-activity soreness should be mild and subside within 24 hours
Suggested Therapeutic Exercise	<p>Strength and Stabilization</p> <ul style="list-style-type: none"> Dumbbell and medicine ball exercises that incorporate trunk rotation and control with rotator cuff strengthening at 90° of shoulder abduction and higher velocities; begin working towards more sport specific activities Higher velocity strengthening and control, such as inertial, plyometrics, and rapid resistive tubing drills; plyometrics should start with 2 hands below shoulder height and progress to overhead, then back to below shoulder with one hand, progressing again to overhead Throwing, swimming, or overhead racquet program as needed depending on the athlete's sport
Cardiovascular Exercise	<ul style="list-style-type: none"> Design to use sport specific energy systems
Progression Criteria	<ul style="list-style-type: none"> Patient may return to sport after receiving clearance from the orthopedic surgeon and the physical therapist or athletic trainer

These rehabilitation guidelines were developed collaboratively between Marc Sherry, PT, DPT, LAT, CSCS, PES (msherry@uwhealth.org) and the UW Health Sports Medicine physician group.

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References:

- Wilk KE, Reinold MM, Dugas JR, Arrigo CA, Moser MW, Andrews JR. Current concepts in the recognition and treatment of superior labral (SLAP) lesions. *J Orthop Sports Phys Ther.* May 2005;35(5):273-291.

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