

# Rehabilitation Guidelines for Anterior Shoulder Reconstruction with Arthroscopic Bankart Repair

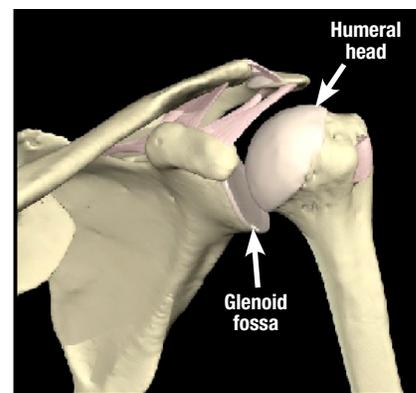
The anatomic configuration of the shoulder joint (glenohumeral joint) is often compared to a golf ball on a tee (Figure 1). This analogy is used because the articular surface of the round humeral head (upper most part of the arm) is approximately four times greater than that of the relatively flat shoulder blade face (glenoid fossa).<sup>1</sup> The stability and movement of the shoulder is controlled by the rotator cuff muscles, ligaments, and the capsulolabral complex of the shoulder. The labrum is a fibrocartilaginous ring which attaches to the bony rim of the glenoid fossa.<sup>1</sup> The labrum doubles the depth of the glenoid fossa to help provide stability.<sup>2</sup> An analogy would be a parked car on a hillside with a block under the tire – the round tire being the humeral head, the road being the glenoid fossa and the chop block being the labrum.

The anatomy of the shoulder allows for greater mobility yet sacrifices stability. For this reason the shoulder is one of the most commonly dislocated joints in the body. Shoulder dislocations can occur from trauma or from hyperlaxity (genetic or acquired looseness of the capsule and ligaments).

Traumatic anterior shoulder dislocations (in which the humeral head is displaced towards the front) most often occur when significant force

is placed on the hand or lower part of the arm when the shoulder is abducted and externally rotated (Figure 2) or the arm is stretched straight out from the body, such as falling on an outstretched hand. When the shoulder dislocates anteriorly the capsule, ligaments and labrum are often torn. The anterior inferior part of the labrum (located between the 3:00 to 6:00 positions on the glenoid) is the area torn with this type of injury (Figure 3). In more severe cases when the labrum is torn a portion of the glenoid may be fractured, and this is referred to as a bony Bankart lesion.

Studies have shown that traumatic shoulder dislocations result in recurrent instability. The degree of recurrent instability is related to the patient's age and sport or activity level. Younger patients are more likely to have recurrent instability. Studies report recurrence rates from 65-95% for patients less than 20 years of age. Simonet<sup>3</sup> reviewed 128 patients who had suffered a shoulder dislocation and found that two years after the initial dislocation, 66% of patients who were less than 20 years old suffered a second dislocation while 40% of patients who were between 20 and 40 years old suffered a second dislocation. None of the patients older than 40 years old had suffered subsequent dislocations. Pevny studied 125 patients with shoulder



**Figure 1** Bony anatomic shoulder model

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**Figure 2** Abducted—externally rotated position of the left shoulder

dislocation over the age of 40 and found that while only 4% of these patients had recurrent instability, 35% of the patients had a rotator cuff tear. It is likely the injury pattern for dislocation changes as we age.

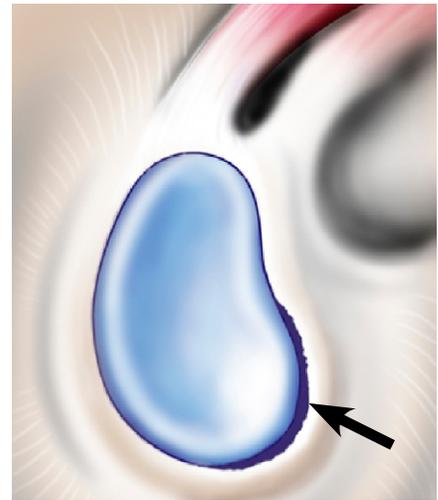
Simonet also compared recurrent dislocations with athletes and non-athletes, with athletes having an 82% recurrence rate and non-athletes having a 30% recurrence rate. The athletic group also had a different recurrence risk based on the type of sport, with overhead and contact sports being more likely to have recurrent dislocations.<sup>3</sup>

Restoring the normal anatomy of the shoulder is the most effective way of preventing recurrent instability and improving function in the young and athletic population. Restoring the anatomy primarily means repairing the torn labrum back to the rim of the glenoid.

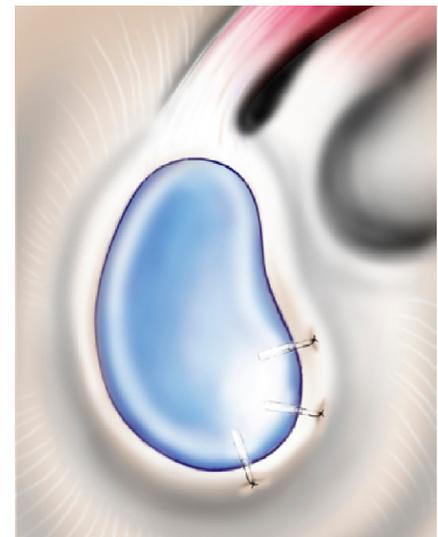
This is called a Bankart repair. This can be done surgically with an arthroscopic technique or an open technique. The arthroscopic technique involves making three very small incisions and using a camera to “see” inside the shoulder joint. The torn tissue is identified then suture anchors or bio-absorbable tacks are used to repair the torn tissue back to its anatomic location (Figure 4). Arthroscopic anterior stabilization has a similar rate of failure to open stabilization after two years. The proposed advantages of arthroscopic repair include less surgical trauma to the adjacent tissue in the shoulder and improved outcomes.

Shoulder stability in healthy individuals is achieved through the structural integrity of the non-contractile (non-muscle) shoulder stabilizers (ligaments, capsule and labrum) and function of the rotator cuff and scapular muscles. Post-operative rehabilitation is essential after arthroscopic Bankart repair. The initial phase will focus on protection and progressive range of motion exercises to ensure proper healing of the repaired anatomical structures. This will be followed by several phases focused on restoring and enhancing the strength and function of the rotator cuff and scapular muscles. In addition to improving the strength of these muscles it is important to improve the reaction time (neuromuscular control) to allow for appropriate protective stability during high speed movements or movements that place the shoulder at risk for dislocation as described previously. Return to sport decisions are determined by an individual’s ability to demonstrate strength and control during these movements.

The rehabilitation guidelines below are presented in a criterion based progression. Specific time frames, restrictions and precautions are given to protect healing tissues and the surgical repair/reconstruction. General time frames are also given for reference to the average, but individual patients will progress at different rates depending on their age, associated injuries, pre-injury health status, rehab compliance and injury severity. The size and location of the labral tear may also affect the rate of post-operative progression.



**Figure 3** Bankart tear (anterior labral tear) When looking at a right shoulder it would normally extend from 3:00 to 6:00 if imagining the glenoid as the face of a clock



**Figure 4** Fixation of the Bankart tear using three suture anchors in the boney glenoid and sutures approximating the labrum back to the boney glenoid

**PHASE I (surgery to 6 weeks after surgery)**

<b>Appointments</b>	<ul style="list-style-type: none"> <li>• Rehabilitation appointments begin 4-10 days after surgery</li> </ul>
<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>• Protect the post-surgical shoulder</li> <li>• Activate the stabilizing muscles of the gleno-humeral and scapulo-thoracic joints</li> <li>• Full active and passive range of motion for shoulder flexion, abduction, internal rotation and external rotation to neutral</li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>• Sling immobilization required for soft tissue healing for 3 - 4 weeks. Remove sling during the 4th week in safe environments</li> <li>• Hypersensitivity in axillary nerve distribution is a common occurrence</li> <li>• No shoulder external rotation with abduction for 6 weeks to protect repaired tissues</li> </ul>
<b>Suggested Therapeutic Exercises</b>	<ul style="list-style-type: none"> <li>• Begin week 3, sub-maximal shoulder isometrics for internal rotation and external rotation, flexion, extension, adduction and abduction</li> <li>• Active assisted and passive range of motion for shoulder flexion, abduction, internal rotation and external rotation to neutral, progressing to active range of motion at week 5</li> <li>• Hand gripping</li> <li>• Elbow, forearm, and wrist active range of motion</li> <li>• Cervical spine and scapular active range of motion</li> <li>• Desensitization techniques for axillary nerve distribution</li> <li>• Postural exercises</li> </ul>
<b>Cardiovascular Fitness</b>	<ul style="list-style-type: none"> <li>• Walking, stationary bike - sling on</li> <li>• No swimming or treadmill</li> <li>• Avoid running and jumping due to the distractive forces that can occur at landing</li> </ul>
<b>Progression Criteria</b>	<ul style="list-style-type: none"> <li>• Full active range of motion in all cardinal planes</li> <li>• 5/5 internal and external rotator strength at 0° of shoulder abduction</li> <li>• Negative apprehension and impingement signs</li> </ul>

**PHASE II (begin after meeting Phase I criteria, usually 6 weeks after surgery)**

<b>Appointments</b>	<ul style="list-style-type: none"> <li>• Rehabilitation appointments are once every 1 to 2 weeks</li> </ul>
<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>• Full shoulder active range of motion in all cardinal planes</li> <li>• Progress shoulder external rotation range of motion gradually to prevent oversteering the repaired anterior tissues of the shoulder</li> <li>• Strengthen shoulder and scapular stabilizers in protected position (0° - 45° abduction)</li> <li>• Begin proprioceptive and dynamic neuromuscular control retraining</li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>• Avoid passive and forceful movements into shoulder external rotation, extension and horizontal abduction.</li> </ul>

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<b>Suggested Therapeutic Exercises</b>	<ul style="list-style-type: none"> <li>• Active assisted and active range of motion in all cardinal planes - assessing scapular rhythm</li> <li>• Gentle shoulder mobilizations as needed</li> <li>• Rotator cuff strengthening in non-provocative positions (0° - 45° abduction)</li> <li>• Scapular strengthening and dynamic neuromuscular control</li> <li>• Cervical spine and scapular active range of motion</li> <li>• Postural exercises</li> <li>• Core strengthening</li> </ul>
<b>Cardiovascular Fitness</b>	<ul style="list-style-type: none"> <li>• Walking, stationary bike, Stairmaster</li> <li>• No swimming or treadmill</li> <li>• Avoid running and jumping until athlete has full rotator cuff strength in a neutral position due to the distractive forces that can occur at landing</li> </ul>
<b>Progression Criteria</b>	<ul style="list-style-type: none"> <li>• Full shoulder active range of motion</li> <li>• Negative apprehension and impingement signs</li> <li>• 5/5 shoulder internal and external rotator strength at 45° abduction</li> </ul>

### PHASE III (begin after meeting Phase II criteria, usually 10-11 weeks after surgery)

<b>Appointments</b>	<ul style="list-style-type: none"> <li>• Rehabilitation appointments are once every 2 to 3 weeks</li> </ul>
<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>• Full shoulder active range of motion in all cardinal planes with normal scapulo-humeral movement.</li> <li>• 5/5 rotator cuff strength at 90° abduction in the scapular plane</li> <li>• 5/5 peri-scapular strength</li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>• All exercises and activities to remain non-provocative and low to medium velocity</li> <li>• Avoid activities where there is a higher risk for falling or outside forces to be applied to the arm</li> <li>• No swimming, throwing or sports</li> </ul>
<b>Suggested Therapeutic Exercises</b>	<p><b>Motion</b></p> <ul style="list-style-type: none"> <li>• Posterior glides if posterior capsule tightness is present. More aggressive ROM if limitations are still present</li> </ul> <p><b>Strength and Stabilization</b></p> <ul style="list-style-type: none"> <li>• Flexion in prone, horizontal abduction in prone, full can exercises, D1 and D2 diagonals in standing</li> <li>• Theraband/cable column/ dumbbell (light resistance/high rep) internal and external rotation in 90° abduction and rowing</li> <li>• Balanceboard in push-up position (with rhythmic stabilization), prone swiss ball walk-outs, rapid alternating movements in supine D2 diagonal, closed chain stabilization with narrow base of support</li> </ul>

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<b>Cardiovascular Fitness</b>	<ul style="list-style-type: none"> <li>• Walking, biking, stairmaster and running (if Phase II criteria has been met)</li> <li>• No swimming</li> </ul>
<b>Progression Criteria</b>	<ul style="list-style-type: none"> <li>• The patient can progress to Phase IV when they have met the above stated goals and have no apprehension or impingement signs</li> </ul>

### PHASE IV (begin after meeting Phase III criteria, usually 15 weeks after surgery)

<b>Appointments</b>	<ul style="list-style-type: none"> <li>• Rehabilitation appointments are once every 3 weeks</li> </ul>
<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>• Patient to demonstrate stability with higher velocity movements and change of direction movements.</li> <li>• 5/5 rotator cuff strength with multiple repetition testing at 90° abduction in the scapular plane</li> <li>• Full multi-plane shoulder active range of motion</li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>• Progress gradually into provocative exercises by beginning with low velocity, known movement patterns</li> </ul>
<b>Suggested Therapeutic Exercises</b>	<p><b>Motion</b></p> <ul style="list-style-type: none"> <li>• Posterior glides if posterior capsule tightness is present</li> </ul> <p><b>Strength and Stabilization</b></p> <ul style="list-style-type: none"> <li>• Dumbbell and medicine ball exercises that incorporate trunk rotation and control with rotator cuff strengthening at 90° abduction. Begin working towards more functional activities by emphasizing core and hip strength and control with shoulder exercises</li> <li>• TB/cable column/ dumbbell IR/ER in 90 abduction and rowing</li> <li>• Higher velocity strengthening and control, such as the inertial, plyometrics, rapid Theraband drills</li> <li>• 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</li> <li>• Begin education in sport specific biomechanics with very initial program for throwing, swimming or overhead racquet sports</li> </ul>
<b>Cardiovascular Fitness</b>	<ul style="list-style-type: none"> <li>• Walking, biking, stairmaster and running (if Phase II criteria is met)</li> <li>• No swimming</li> </ul>
<b>Progression Criteria</b>	<ul style="list-style-type: none"> <li>• Patient may progress to Phase V if they have met the above stated goals and have no apprehension or impingement signs</li> </ul>

**PHASE V (begin after meeting Phase IV criteria, usually 20 weeks after surgery)**

<b>Appointments</b>	<ul style="list-style-type: none"> <li>• Rehabilitation appointments are once every 3 weeks</li> </ul>
<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>• Patient to demonstrate stability with higher velocity movements and change of direction movements that replicate sport specific patterns (including swimming, throwing, etc)</li> <li>• No apprehension or instability with high velocity overhead movements</li> <li>• Improve core and hip strength and mobility to eliminate any compensatory stresses to the shoulder</li> <li>• Work capacity cardiovascular endurance for specific sport or work demands</li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>• Progress gradually into sport specific movement patterns</li> </ul>
<b>Suggested Therapeutic Exercises</b>	<p><b>Motion</b></p> <ul style="list-style-type: none"> <li>• Posterior glides if posterior capsule tightness is present</li> </ul> <p><b>Strength and Stabilization</b></p> <ul style="list-style-type: none"> <li>• Dumbbell and medicine ball exercises that incorporate trunk rotation and control with rotator cuff strengthening at 90° abduction and higher velocities. Begin working towards more sport specific activities</li> <li>• Initiate sport specific programs (throwing program, overhead racquet program or return to swimming program) depending on the athlete's sport</li> <li>• High velocity strengthening and dynamic control, such as the inertial, plyometrics, rapid thera-band drills</li> </ul>
<b>Cardiovascular Fitness</b>	<ul style="list-style-type: none"> <li>• Design to use sport specific energy systems</li> </ul>
<b>Progression Criteria</b>	<ul style="list-style-type: none"> <li>• Patient may return to sport after receiving clearance from the orthopedic surgeon and the physical therapist/athletic trainer</li> </ul>

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

Updated 1/2011

**References**

1. 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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3. Simonet WT, Cofield RH. Prognosis in anterior shoulder dislocation. *Am J Sports Med.* 1984 Jan-Feb;12(1):19-24.

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