

Rehabilitation Guidelines for Open Latarjet Anterior Shoulder Stabilization

The anatomic configuration of the shoulder joint (glenohumeral joint) is often compared to a golf ball on a tee. 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). 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. The labrum doubles the depth of the glenoid fossa to help provide stability. An analogy would be a parked car on a hillside with a chop 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 great mobility yet sacrifices stability. 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 (forceful dislocation out the front of the shoulder) most often occur when significant force is placed on the hand or lower part of the arm when the shoulder is out to the side and rotated backward



Figure 1 L to R: Lateral view of glenoid post laterjay with humerus removed. Anterior view of shoulder post laterjay. Two screws are fixing a bony piece of the coracoid to the front of the bony glenoid fossa. This increases the surface area of the “golf tee” portion of the shoulder joint and increases its stability.

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 o'clock to 6 o'clock positions on the glenoid) is the area torn with this type of injury. In more severe cases when the labrum is torn a portion of the glenoid bone may be broken (fractured) and this is referred to as 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 reviewed 128 patients who 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 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 people age.

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

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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 usually 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.

This technique is not sufficient if there is also a significant bony injury that occurs during the dislocation. Consider If the side of the golf tee breaks, the golf ball will fall off the tee. Similarly, in the shoulder, if more than 20% of the anteroinferior glenoid is missing or fractured then the standard Bankart labral repair will not give a stable shoulder. A bipolar lesion, that is, loss of glenoid bone plus a bony defect in the humeral head, will also be unstable with only a labral repair. The failure rate following arthroscopic Bankart repair has been shown to dramatically increase from 4% to 67% in patients with significant bone loss. These injuries will require a procedure called a Latarjet anterior shoulder stabilization.

The principle of a Latarjet procedure is to cut and move the coracoid bone with the conjoined tendon (coracobrachialis and short head of biceps) to fill in the bony defect in the glenoid (to recreate the contour of the golf tee). See figure 1. Basically moving bone from one part of the shoulder to another to act as a bony block. The repositioning of the conjoined tendon also helps stabilize the shoulder by acting as

a sling when the arm is abducted and externally rotated, stopping the humeral head dislocating anteriorly. This procedure is very effective at reducing recurrent dislocations, although it is a more complex surgery that requires longer rehabilitation and may result in a slight decrease in range of motion.

Shoulder stability in healthy individuals is achieved through the structural integrity of the non-contractile (nonmuscle) shoulder stabilizers (ligaments, capsule and labrum) and function of the rotator cuff and scapular muscles. Post-operative rehabilitation is essential after Latarjet anterior shoulder stabilization. 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 along with amount of bony injury may also affect the rate of post-operative progression.

Rehabilitation Guidelines for Open Latarjet Anterior Shoulder Stabilization

PHASE I (surgery to 6 weeks after surgery)

Appointments	<ul style="list-style-type: none"> • Rehabilitation appointments begin 4-10 days after surgery
Rehabilitation Goals	<ul style="list-style-type: none"> • Protect the post-surgical shoulder • Activate the stabilizing muscles of the gleno-humeral and scapula-thoracic joints • 135° of active and passive range of motion (PROM) for shoulder flexion, abduction, internal rotation (IR) and external rotation (ER) to neutral
Precautions	<ul style="list-style-type: none"> • Sling immobilization required for soft tissue healing for 4-6 weeks. Remove sling during the 4th week in safe environments • Hypersensitivity in axillary nerve distribution is a common occurrence <p style="margin-left: 20px;">Range of Motion Precautions</p> <p style="margin-left: 20px;">0-3 weeks:</p> <ul style="list-style-type: none"> - No shoulder extension, abduction, IR, ER past 20° in neutral or ER with abduction. Stop flexion at first end feel or at 90° - Avoid bicep active elbow flexion due to detachment of the coracobrachialis and the short head of the biceps <p style="margin-left: 20px;">4-6 weeks:</p> <ul style="list-style-type: none"> - Forward elevation/flexion to 135° - IR to 50° - ER in scapular plane and 90° abduction to 30°
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> • Begin week 4, sub-maximal shoulder isometrics for ER, flexion, extension, adduction and abduction. Take caution to start gradually and in neutral position. Avoid IR • PROM 0-3 weeks with guidelines above, starting active assistive range of motion (AAROM) at 4 weeks • Scapular squeezes and scapular clocks • Hand gripping • Elbow, forearm and wrist active ROM • Cervical spine ROM • Desensitization techniques for axillary nerve distribution • Postural exercises
Cardiovascular Exercise	<ul style="list-style-type: none"> • Walking, stationary bike - sling on • No swimming or treadmill • Avoid running and jumping due to the distractive forces that can occur at landing
Progression Criteria	<ul style="list-style-type: none"> • 5/5 IR and ER strength at 0° of shoulder abduction • Full flexion and abduction PROM

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PHASE II (6 weeks after surgery to 12 weeks)

Appointments	<ul style="list-style-type: none"> • Rehabilitation appointments are once every 1-2 weeks
Rehabilitation Goals	<ul style="list-style-type: none"> • Full shoulder active ROM in all cardinal planes • Progress shoulder ER ROM gradually to prevent overstressing the repaired anterior tissues of the shoulder • Strengthen shoulder and scapular stabilizers in protected position (0° - 45° abduction) • Begin proprioceptive and dynamic neuromuscular control retraining
Precautions	<ul style="list-style-type: none"> • ROM Precautions 7-9 weeks: <ul style="list-style-type: none"> - Forward elevation/flexion to 155° - IR at 90 to 60° - ER in scapular plane to 60° - ER in 90 degrees abduction to 75° 10-12 weeks: <ul style="list-style-type: none"> - Progressively and gradually moving to full AROM
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> • AAROM and active range of motion (AROM) in all cardinal planes – assessing scapular rhythm • Gentle shoulder mobilizations as needed • Rotator cuff strengthening in non-provocative positions (0° - 45° abduction) • Scapular strengthening and dynamic neuromuscular control • Cervical spine and scapular active range of motion • 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 athlete 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 shoulder active ROM • Negative apprehension and impingement signs • 5/5 shoulder IR and ER strength at 45° abduction

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PHASE III (begin after meeting Phase II criteria, usually 12 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 AROM in all cardinal planes with normal scapulohumeral movement • 5/5 rotator cuff strength at 90° abduction in the scapular plane • 5/5 peri-scapular strength
Precautions	<ul style="list-style-type: none"> • 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"> • Posterior glides if posterior capsule tightness is present. More aggressive ROM if limitations are still present <p>Strength and Stabilization</p> <ul style="list-style-type: none"> • Flexion in prone, horizontal abduction in prone, full can exercises, D1 and D2 diagonals standing • TheraBand/cable column/ dumbbell (light resistance/high rep) IR and ER in 90° abduction and rowing • Balance board 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
Cardiovascular Exercise	<ul style="list-style-type: none"> • Walking, biking, Stairmaster and running (if Phase II criteria has been met) • No swimming
Progression Criteria	<ul style="list-style-type: none"> • Patient may progress to Phase IV if they have met the above stated goals and have no apprehension or impingement signs

PHASE IV (begin after meeting Phase III criteria, usually 16-18 weeks after surgery)

Appointments	<ul style="list-style-type: none"> • Rehabilitation appointments are once every 3 weeks
Rehabilitation Goals	<ul style="list-style-type: none"> • Patient to demonstrate stability with higher velocity movements and change of direction movements • 5/5 rotator cuff strength with multiple repetition testing at 90° abduction in the scapular plane • Full multi-plane shoulder AROM
Precautions	<ul style="list-style-type: none"> • Progress gradually into provocative exercises by beginning with low velocity, known movement patterns

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Suggested Therapeutic Exercise	<p>Motion</p> <ul style="list-style-type: none"> • Posterior glides if posterior capsule tightness is present <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° abduction. Begin working towards more functional activities by emphasizing core and hip strength and control with shoulder exercises • TheraBand/cable column/ dumbbell IR and ER in 90 abduction and rowing • Higher velocity strengthening and control, such as the inertial, plyometrics, rapid TheraBand 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 • Begin education in sport specific biomechanics with very initial program for throwing, swimming or overhead racquet sports
Cardiovascular Exercise	<ul style="list-style-type: none"> • Walking, biking, Stairmaster and running (if Phase III criteria has been met) • 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 apprehension or impingement signs

PHASE V (begin after meeting Phase IV criteria, usually 24 weeks after surgery)

Appointments	<ul style="list-style-type: none"> • Rehabilitation appointments are once every 3 weeks
Rehabilitation Goals	<ul style="list-style-type: none"> • Patient to demonstrate stability with higher velocity movements and change of direction movements that replicate sport specific patterns (including swimming, throwing, etc) • No 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/work demands
Precautions	<ul style="list-style-type: none"> • Progress gradually into sport specific movement patterns
Suggested Therapeutic Exercise	<p>Motion</p> <ul style="list-style-type: none"> • Posterior glides if posterior capsule tightness is present <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° abduction and higher velocities. Begin working towards more sport specific activities • Initiate sport specific programs (throwing program, overhead racquet program or return to swimming program) depending on the athlete's sport • High velocity strengthening and dynamic control, such as the inertial, plyometrics, rapid TheraBand drills

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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/athletic trainer

These rehabilitation guidelines were developed collaboratively by UW Health Sports Rehabilitation and the UW Health Sports Medicine Physician group.

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REFERENCES

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