Shoulder Disorders
LEO Shoulder Disorders Chapter

Introduction
The law enforcement officer (LEO) with a shoulder disorder(s) who has adequate active range-of-motion of the shoulder, shoulder stability, and strength, should be able to safely and effectively perform essential job functions. A functional framework for evaluation is presented in Appendix A.

Rotator Cuff, Labral injuries, Ligament, and Tendon
Recommendations for treatment and recovery time are based upon averages and the most straightforward presentation for acute injuries. LEOs with concomitant injuries or complications generally require additional treatment and recovery time.

a. Injuries Not Requiring Surgical Repair
LEOs with non-specific shoulder strains that have been evaluated and determined to not require surgical repair and who have demonstrated a successful return to full-training activities, can generally return to unrestricted duty in less than 8 weeks.

b. Injuries Requiring Surgical Repair NOT Including Biceps or Labrum
After surgical repair, LEOs who have demonstrated a successful return to full-training activities should be able to return to unrestricted duty in 4-6 months. Rotator cuff injuries with associated labral injury and injuries to the dominant extremity may require a longer rehabilitation course. Partial tears and/or isolated injuries to the non-dominant extremity may be able to return sooner. LEOs without surgical reconstruction of the rotator cuff, where surgery is indicated, are likely to need restrictions.

c. Labral Tears
An acute superior labral anterior posterior tear (SLAP) lesion can cause pain, loss of motion, and weakness of the affected shoulder. Type I and selected type II labral tears, absent other intra-articular pathologies, are routinely treated conservatively without surgery. LEOs who have demonstrated a successful return to full-training activities should be able to return to unrestricted duty in within 12 weeks.

**Type II-X Labral Tears:** LEOs who have demonstrated a successful return to full-training activities should be able to return to unrestricted duty 4-6 months after surgical repair. LEOs without surgical reconstruction of large labral tears who have persistent instability and restricted range of motion are likely to need restrictions.

d. Biceps Tendon Injuries
LEOs with a partial biceps tear who have demonstrated a successful return to full-training activities should be able to return to unrestricted duty within 8 weeks. After surgical repair, LEOs who have demonstrated a successful return to full-training activities should be able to return to unrestricted duty in 4-6 months.

e. Deltoid Tendon Injuries
An uncomplicated deltoid muscle strain or partial tear is usually self-limiting and generally does not require surgical repair. LEOs who have demonstrated a successful return to full-training activities should be able to return to unrestricted duty within 4 weeks. Severe strains/large tears may require 2-3 months to successfully return to full-training activities.

Shoulder Instability and Dislocation

a. Anterior Dislocations/Initial Dislocation

**LEOs 40 years of age or older:**

i. *Non-surgical* – Those treated by closed reduction, who have demonstrated a successful return to full-training activities should be able to return to unrestricted duty 6 months after injury.
ii. *Surgical* – Those treated with surgical repair, who have then demonstrated successful return to full-training activities, should be able to return to unrestricted duty in 6 months post-surgery.

**LEOs under 40 years of age:**

i. *Non-Surgical* – Those treated by closed reduction should be restricted from full duty for at least 3 years.\(^3,6,7,8,9,10,11\)

ii. *Surgical* – Those who at the time of surgical repair, were determined to have a [Baker Type 1](#) (capsular tears with no labral lesions, stable under anesthesia, and had no or minimal hemarthrosis) injury and who demonstrated a successful return to full-training activities should be able to return to unrestricted duty 6 months post-surgery.

iii. *Surgical* – Those who at the time of surgical repair were determined to have a [Baker Type 2 or 3](#) injury (Type 2: capsular tears, partial labral detachments, mildly unstable and mild to moderate hemarthrosis; Type 3: capsular tears with labral detachments grossly unstable and large hemarthrosis, and complete capsular/labral detachments) and who have successfully returned to full-training activities should not be cleared to full duty until at least 2 years following surgery.

b. *Posterior Dislocations*

   When dealing with a posterior shoulder dislocation, it is important to remember that this condition is often associated with a seizure disorder. Therefore, the examiner is advised to review the LEO’s medical history when treating this condition.

   LEOs with a posterior dislocation from trauma, without evidence of instability in rehabilitation and who have demonstrated a successful return to full-training activities should be able to return to unrestricted duty in 6 months.

   LEOs with a posterior dislocation due to the following mechanisms will require surgery in order to return to unrestricted duty:
   - Related to seizure
   - Traumatic with persistent instability
   - Recurrent posterior shoulder dislocation

   LEOs who have demonstrated a successful return to full-training activities should be able to return to unrestricted duty in 6-9 months post-surgery.\(^12,13,14\)

c. *Inferior Shoulder Dislocation*

   LEOs can be treated non-surgically if reduction is easily obtained. LEOs who have demonstrated a successful return to full-training activities should be able to return to unrestricted duty. These dislocations are so rare that a timeframe for return to full duty is unclear.

   If reduction is not successful, surgical treatment is required.\(^15\) LEOs who have demonstrated a successful return to full-training activities should be able to return to unrestricted duty in 6 months.

d. *Posterior Shoulder Instability Without Prior Dislocation*

   LEOs with posterior shoulder instability can be treated conservatively. Those who have demonstrated a successful return to full-training activities should be able to return to unrestricted duty.

   Those who fail conservative treatment are candidates for surgery.\(^12\) Following surgery, those who have demonstrated a successful return to full-training activities should be able to return to unrestricted duty in 6 months.
Fracture

a. **Proximal Humeral Fracture**
LEOs with a history of uncomplicated proximal humeral fractures, without an associated neurovascular injury that does not require reduction and percutaneous pinning, can be treated non-operatively. Those who demonstrate a successful return to full-training activities should be able to return to unrestricted duty in 4-6 months. A proximal humeral fracture that requires closed reduction and percutaneous pinning may require up to 9 months before return to full duty. If open reduction and internal fixation is required, recovery time may take longer before returning to full duty.16,17,18

b. **Scapular Fracture**
Scapular fractures are frequently associated with high-speed blunt force trauma. A complete review of injury history is required to evaluate for other injuries when determining treatment and return to duty for this condition.

LEOs with a history of an uncomplicated non-displaced scapular fracture without an associated injury, who have demonstrated a successful return to full-training activities, should be able to return to unrestricted duty 8-12 weeks following the fracture.2,19

LEOs with displaced scapular fractures treated non-operatively, who have demonstrated a successful return to full-training activities, should be able to return to unrestricted duty within 6 months post-fracture. LEOs with a displaced scapular fracture, especially involving the glenoid fossa or ipsilateral clavicle or with displacement, usually require surgery.20,21 A fracture that requires surgery generally requires 6 months after surgery before returning to full physical activities. More extensive fractures, especially those that involve injuries to additional body systems generally require additional time.

c. **Clavicle Fracture**
LEOs with a clavicular fracture not requiring surgery, who have demonstrated successful return to full-training activities, should be able to return to unrestricted duty 8-12 weeks following the fracture.22

Acromioclavicular (AC) Joint

a. **Injuries Not Requiring Surgical Repair**
LEOs with type I or II and III AC separations not requiring surgical repair, who have demonstrated a successful return to full-training activities, should be able to return to unrestricted duty within 8 weeks following the injury.

b. **Injuries Requiring Surgical Repair**
LEOs with type II-IV injuries that have been surgically repaired who have demonstrated a successful return to full-training activities, should be able to return to unrestricted duty 4-6 months following the repair. LEOs without surgical repair where surgery is indicated are likely to require restrictions.

Acute Inflammatory Shoulder Conditions

*Tendonitis/Impingement/Bursitis*
Tendonitis of one or more shoulder tendons is generally treated conservatively. LEOs with shoulder impingement and/or tendonitis and/or bursitis who have demonstrated a successful return to full-training activities, should be able to return to unrestricted duty within 6 weeks following onset of symptoms.
Chronic Degenerative Shoulder Conditions

*Adhesive Capsulitis (Frozen Shoulder)*
This condition may respond to conservative treatment, or may require intervention.\(^{23}\) (manipulation under anesthesia or arthroscopic lysis of adhesions.) LEOs who have demonstrated a successful return to full-training activities, should be able to return to unrestricted duty within 12 weeks after starting treatment. Return of full active range of motion may take up to 18-24 months.

*Chronic Rotator Cuff Impingement/Chronic Tendinosis*
LEOs with chronic impingement symptoms, loss of shoulder function, or pain that limits or prevents performance of essential job functions will require restrictions.

**Shoulder Arthroplasty**
LEOs with shoulder arthroplasty (of any type) who have residual instability, insufficient range of motion or strength will likely require restrictions. However, if they have demonstrated a successful return to full-training activities, they should be able to return to unrestricted duty 6-8 months following surgery.
Appendix A: Overview of Medical Evaluation of Shoulder Disorders

A functional shoulder is an essential physical requirement for all LEOs. Post-injury evaluation and management of shoulder injuries in an occupational setting is complicated by many factors including age-related degeneration and pre-existing loss of strength and mobility of the shoulder girdle. Peer-reviewed studies can provide a framework for functional outcomes and timing of return to activities after a shoulder injury; however, much of the reviewed literature on return to high-demand activities is focused on the sport-specific activities of baseball (pitching), tennis (serving), and volleyball (hitting). Despite the limitations in comparing specific athletic requirements to the essential job functions of a LEO, successful return to sport requires a highly functional shoulder. Therefore, there should be minimal differences in assessing the ability to return to play for an athlete and return to unrestricted duty as a LEO.

Medical Evaluation

**History** – The most important part of the initial examination is to obtain a proper history focused on both the mechanism of injury and the development of shoulder symptoms. General review should include any injuries associated with sports activities, motor vehicle crash or other traumatic events. A focused history on the shoulder should also include a review of any prior shoulder trauma that places an individual at risk for shoulder injury or instability. In addition, a general medical review to include such medical disorders as diabetes, chronic seizure disorder, or history of any rheumatological problems.24

**Range of motion** – Successful return to play for sport-specific shoulder activities typically requires that the athlete achieve normal elevation (abduction) of the shoulder and minimal loss of external rotation compared with the uninjured shoulder.25,26 Given that shoulder movement is the combination of movements at the sternoclavicular, acromio-clavicular, scapulothoracic, and glenohumeral joints,27 the traditional evaluation of the separate range-of-motion assessments of flexion, extension, internal and external rotation of the glenohumeral joint fails to capture the necessary coordinated movements needed for successful return to sport. In addition, this method fails to account for pre-injury range of motion limitations. Internal rotation of the shoulder should also be assessed functionally (i.e., internal rotation sufficient to access equipment on the duty belt) – however, the examiner should recognize that these assessments are not specific for internal rotation at the glenohumeral joint.28

**Strength** – It is important to recognize that most of the muscles in the shoulder girdle are either scapular stabilizers (trapezius, serratus anterior, levator scapula, rhomboids) or shoulder joint compressors (teres major, supraspinatus, infraspinatus, subscapularis, teres minor).29 Therefore, isolated testing of each muscle adds little information in return to work determinations. (Note: strength testing of the shoulder has not been found to correlate with athletic outcomes, suggesting that an athlete’s subjective reports of function are the primary predictor of successful return to play).25

**Proposed assessment for medical clearance for any shoulder disorder:**

1. Documentation of initial injury/disorder including any concomitant injuries to same-side hand, wrist, elbow, thorax.
2. Documentation of clinical evaluation (including imaging) that led to the diagnosis.
3. Timeframe from initial injury to current evaluation – most if not all rehabilitation pathways are time-dependent for increasing activities.
4. Documentation of treatment of condition (operative vs. non-operative).
5. Pain medication – Document if pain mainly occurs during or after training activities (likely to be cleared for unrestricted duty if pain is not incapacitating) or if pain has prevented return to training activities (disqualifying condition).

6. Objective data
   
   **Range of motion:**
   
   a. **Elevation (abduction).** While elevation is measured in the scapular plane for throwing athletes, non-sport specific athletes can be measured in their self-selected plane of elevation. LEOs who have asymmetry of motion >20° or are unable reach objects above their shoulder, or are unable to elevate the shoulder beyond 140° require further job simulation testing.
   
   b. **External rotation at 90°/90°.** External rotation is measured with the shoulder at 90° of abduction with an elbow flexion of 90° in the standing position. In this position, the forearm should be parallel to the floor, palm down which represents 0° of external rotation. More than a 20° loss of external rotation in the injured shoulder compared to the unaffected arm is a potentially disqualifying condition and requires job simulation testing.
   
   c. **Posterior Reach.** The term posterior reach is preferred to internal rotation for functional assessment of the upper extremity in order to distinguish it from internal rotation measures performed at 90°/90°. Posterior reach (internal rotation) is defined as having the patient reach behind their back, back of the hand against the back and documenting the vertebral level reached by the tip of the thumb. It is the consensus of the Task Force that LEOs should be able to: 1) achieve similar posterior reach with both upper extremities; and 2) have posterior reach to at least the level of the intercristal line (defined as the line joining the superior aspect of the iliac crests posteriorly) or require job simulation testing.

7. Documentation of physical activity level since the treatment of the condition.

8. Documentation of any instances where the affected shoulder has given way or failed during sports and/or vigorous activity. Document any activities the LEO has avoided since injuring the shoulder.

9. If the police physician is concerned with the LEO’s ability to return to unrestricted duty, the following job simulation tasks may be suggested to the agency as part of the return-to-work decision making: climbing (fence, ladder, over obstacles), pushing dragging and lifting heavy objects without assistance (weight to be define by the agency), practicing defensive tactics, accessing a long gun from the partition of the patrol car (if this is an essential job function).

10. Before returning to unrestricted duty, the LEO has to successfully return to training activities without difficulties. Achieving pre-injury function in sports specific activities (i.e., throwing, serving in tennis) are not considered necessary to return to unrestricted duty as a LEO.

11. Instability Testing (as indicated by history)
   
   - **Apprehension test.** Often predictive of anterior instability, particularly for individuals at risk for re-dislocation. (Testing is useful for individuals with a dislocation who are being treated nonoperatively in predicting risk for re-dislocation/instability).31,32,33,34
   
   - **Sulcus sign.** If present often indicates multidirectional instability or capsular laxity.

The presence of any instability on testing or prior dislocation requires further evaluation.

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a. Safran et al., used the apprehension test to assess the risk of recurrent dislocation after initial anterior shoulder dislocation. At 24-month follow-up, a recurrent dislocation had occurred in 36.8% and 71.4% of those with a negative and positive 6-week apprehension sign respectively.32
Appendix B: Validated Tools for Determining Shoulder Recovery

Various validating scores for shoulder recovery have been developed and although they greatly assist in determining patient recovery from shoulder injury or surgery, they all have shortcomings. The shoulder is a highly mobile joint and as previously discussed is also dependent upon mobility of the elbow and the wrist for full function. This has led to some scoring systems focusing on upper extremity function rather than the shoulder as an isolated joint.

DASH: A self-assessment score for multiple disorders of the upper extremities. It has 30 items that assess both symptoms and functions. It is not specific to the shoulder but measures the function of the upper extremity. A DASH score of <15 indicates no problems.

CONSTANT Score. Clinical examination and patient interview or self-assessment. This is often used for shoulder recovery. This test requires some specialized testing equipment for strength testing. This test has 4 domains: pain, mobility, ADLs, and strength. A CONSTANT score of 15 indicates normal function.

Oxford. General scoring systems for shoulder operations other than stabilization: 4 items about pain and 8 items about daily function. It is scored from 0 being the worst to 4 being the best.

Western Ontario Shoulder Instability (WOSI) Index. Used as a part of the assessment if shoulder instability is an issue. It is a self-assessment, containing 21 items in 4 domains: physical (including pain), sports/recreational/work, lifestyle, emotions. The WOSI is scored from 0 (best) to 100 (worst).

Athletic Shoulder Outcome Rating Scale. Used in athletics with sport-specific shoulder demands. It is scored from 0-100 with scores from 90-100 indicating “excellent” outcome. Ninety percent (90%) of the scoring is subjective, with 10 points lost for each drop in self-reported athletic performance.25
Appendix C: Discussion of Shoulder Disorders

ROTATOR CUFF INJURIES
Shoulder impingement is a progressive disorder that results in chronic degeneration of the tendons of the rotator cuff. It is an injury that affects the muscles of the rotator cuff, rotator cuff strength, and range of motion, but does not necessarily require surgical intervention. Individuals with surface or partial thickness tears of the rotator cuff clinically may be included in this category. This condition may progress to partial full thickness or complete full thickness rotator cuff tear.

Rotator cuff injuries are also associated with overhead activities and highly repetitive motions, and can be thought of that is progressive wear and tear of the cuff and accentuated by those activities that require repetitive overhead use of the arm and/or repeated gripping and grasping. It is also promoted by anatomic impingement morphology, certain medical conditions such as diabetes, and the habit of smoking. Specifically, an actual rotator cuff tear is generally caused by an unambiguous traumatic event and with surgery most individuals successfully recover. Less than optimal outcomes are related to a variety of premorbid conditions and failure to return to work becomes more likely at age greater than 55 years and is often associated with the possibility of retirement. Rotator cuff injuries are common in the workers’ compensation system and patients benefit greatly from treatment and surgical repair of these tears. However, disparities exist between workers’ compensation patients and their non-workers’ compensation counterparts.

A full-thickness or complete tear involves disruption of the rotator cuff muscle with retraction. A partial tear does not involve muscle retraction and is clinically similar to impingement. There are important differentiations between the condition of impingement and a partial rotator cuff tear. The prevalence of partial tears is anywhere from 13-32% and is age-related; usually occurring after the fifth decade of life and more often requires surgical intervention.

Diagnostic Studies
Baseline x-rays may be beneficial initially to determine evidence of arthritis or chronic calcific tendinitis in the shoulder. Sometimes impingement morphology may be visualized on plain x-rays. MRI scan remains the gold standard for determining complete rotator cuff tear. However, ultrasound in the hands of an experienced operator is as sensitive and specific. Magnetic imaging indicates about 4% of individuals under age 40 have an asymptomatic rotator cuff tear with the figure increasing to greater than 50% in individuals over age 60. Partial rotator cuff tears do not involve complete cuff disruption and so are sometimes difficult to visualize by either scan. The most sensitive test for this condition is an MRI arthrogram.

Physical Exam Findings
A variety of shoulder tests are available, many of which are familiar to any examiner. Literature cannot fully recommend a specific set of tests that have a high degree of sensitivity. Based on a 2008 data review and original data, the use of any single test to make a pathognomonic diagnosis cannot be universally recommended. Studies have noted that there was insufficient evidence to base a selection of physical tests for rotator cuff impingement as local lesions of the bursa tendon or labrum may also accompany impingement.

Treatment
Surgical treatment of a rotator cuff tear can provide good clinical results especially in patients who are operated on within the first 3 weeks after the injury. After surgery, 95% of patients have no limitations in activities of daily living and are satisfied with their treatment.
Active physical therapy remains a cornerstone and rehabilitative care post-surgery. For rotator cuff repair, a staged recovery of range of motion over a 6-month period, and strengthening progression beginning at post-operative week 6; in a functional progression for returned athletic or demanding work activities between post-operative months 4 and 6. No evidence was found that immobilization after arthroscopic rotator cuff repair proved superior to early motion rehabilitation in terms of tendon healing and outcome. Clinical outcomes also suggest that early passive range-of-motion exercises are helpful, but not mandatory after rotator cuff repair of small- to medium-sized full-thickness tears. Early mobilization does allow quicker range-of-motion recovery.\(^{50,51}\)

**Prevention and Post-Rehabilitation Care**

Most individuals have a successful outcome with return of preinjury physical abilities. Persons left with a defect post-arthroscopic repair (incomplete rotator cuff repair) will maintain these defects which in time generally increase in size. The affected shoulders are often asymptomatic, but there is usually strength loss. In one study, after 7.9 years, patients with recurrent defects after rotator cuff repair still had improvement in pain, function, and satisfaction.\(^{52}\) These findings suggest patients with current defects can remain asymptomatic over the long term, but will predictably lose strength in the involved extremity.

In addition to the required physical therapy, there is evidence to suggest that specific physical therapy training for dynamic stabilizer muscles enhances rotator cuff muscle strength, core stability, throwing distance, and flexibility.\(^{53}\) These results suggest that full-training activities can be useful in preventing shoulder injuries.\(^{53}\)

**ACROMIOCLAVICULAR (AC) JOINT INJURY**

The AC joint is subject to complex motion of rotation to the shoulder; it moves in various planes. It is also subject to compressive loads, especially in certain weightlifting activities. Due to exposed position, the AC joint has a high risk for direct injury from falls or blows. The most common injury to the AC joint results from a direct impact.

**AC Separation**

There are 6 types of injury to be considered:\(^{54}\):

1. Type I – AC ligaments are sprained, but the joint is intact.
2. Type II – The AC joint is torn, but the CC ligaments (coracoclavicular ligament complex) are intact.
3. Type III – Both the AC and CC ligaments are torn.
4. Type IV – There is complete dislocation with posterior displacement of the distal clavicle into or through the fascia of the trapezius.
5. Type V – Greater degree of soft tissue damage.
6. Type VI – Inferior AC joint dislocations into subacromial or subcoracoid position.

**Diagnosis**

Diagnostics for the AC joint primarily involve x-ray testing. Stress x-rays can determine the degree of separation. Stability of the AC joint can be assessed with the cross-body adduction stress test, and acromial clavicular resistant extension test, and active compression test. Assessment of physical tests for isolated AC joint lesion have not shown that any one specific test to be significantly reliable. Therefore, a combination of a variety of tests is recommended.\(^{55,56}\)

**Treatment**

Conservative treatment for acromioclavicular separation type I is recommended. Surgical treatments for Type III acromioclavicular injuries have not changed significantly since the 1990s with the exception of
increased preference for distal clavicle resection. Management of Type II AC separation is still controversial; however, 80% of patients are treated conservatively without surgery.\textsuperscript{57,58}

**Rehabilitation**

Conservative treatment and some physical therapy to increase strength and tone of the stabilizing muscles of the shoulder girdle may allow individuals to return to regular duty. Type III joint separations remain the most problematic and controversial, due to differing opinions about treatment options. As discussed, surgery is generally recommended. However, there is evidence describing conservative treatment of Type III separations with physical therapy and successful return to full activity within 12 weeks.\textsuperscript{59}

**CLAVICLE FRACTURE**

**Treatment**

Clavicle fractures are treated non-surgically using splinting with progressive motion and indication for surgery with displacement and shortening. A retrospective study looking at all clavicle fractures managed surgically over 5 years, noted that the primary indication for surgery was displacement and shortening. Radiological union was achieved in all patients at an average of 13 weeks, ranging up to 24 weeks without major complications.\textsuperscript{22} All patients returned to work on average of 2.6 months having a good Oxford shoulder score.\textsuperscript{22}

**LABRAL TEARS**

The glenohumeral joint is the main shoulder joint and consists of a spherical head which sits in a shallow socket known as the glenoid fossa. The shoulder is made more stable by a ring of firm tissue, called the labrum that helps stabilize the humerus. The long head of the biceps runs through the groove between the greater and lesser tuberosity entering the shoulder deep to the rotator cuff inserting into the superior glenolabrum. The labrum can be torn by mechanisms that include both acute and chronic degeneration. In addition, the biceps tendon at its insertion when damaged may also cause dysfunction of the biceps muscle and shoulder. This can be caused either by acute or chronic trauma.\textsuperscript{60,61}

**Slap Tears**

A superior labrum, anterior to posterior (SLAP) tear is a type of labral injury. A SLAP tear may occur with a fall onto an outstretched arm, anterior traction as in water skiing, superior traction as the result of attempting to break a fall from heights, and inferior traction as a result of a sudden pull when losing hold of a heavy object. Traction injuries also occur in sports involving overhead activities such as throwing (as in baseball) and exert chronic stress on the biceps at labral attachment resulting in tears. An analogous activity in law enforcement would be baton training. A direct blow to the glenohumeral joint has been also recognized as a mechanism of injury as well.\textsuperscript{61,62}

A labral injury can occur with or without biceps injury in activities that cause anterior, superior, or posterior traction of the arm with direct trauma or while the arm is in a fixed position. These injuries may occur with activities that involve forceful motion of the upper extremity such as utilization of the baton and in defensive combat tactics as well as training exercises. Many of these activities are analogous to the throwing motion in the shoulder.\textsuperscript{63}

**Diagnosis**

There are 10 types of labral tears. Types 1 through 4 are the most commonly encountered.\textsuperscript{60,63}

- Type I lesion. The peripheral labral edge remains firmly attached to the glenoid with intact attachment of the bicep tendon. The lesion is a degenerative process common in middle-aged and older patients.
• Type II lesions: The most common tears are Type II (41%). There is usually fraying of the edge of the labrum similar to Type I. The significant finding is a detached biceps anchor, either anterior or posterior.

• Type III lesions constitute 33% of the population studied and consist of a bucket handle tear of the meniscoid superior labrum with a normal biceps attachment. Often, locking symptoms develop as a result of the mobile fragment similar to the bucket handle tear of the meniscus in the knee.

• Type IV is similar to Type III with an extension of the tear into the biceps tendon.

**Diagnostics**

There is no diagnostic gold standard to identify a SLAP lesion. Both MRI and MRI arthrograms may be utilized. Evidence supports a significant improvement in sensitivity accuracy with MRI arthrogram. However, it should be recognized that there is a relatively high incidence of asymptomatic labral tears in persons aged 45-60 years, and this may be a normal age-related finding.

There are a variety of clinical diagnostic tests (O’Brien, crank, clunk, anterior slide, compression rotation, and active compression) that can be performed to help make the determination of a labral injury. Speed’s test is an accurate test for determining the biceps injury. The O’Brien test has good correlation for a Type II SLAP lesion. Most tests are fairly nonspecific. Clinical history and examination remain essential with a focused review for symptoms such as locking or a clunk or click in the shoulder. The literature suggests the use of a combination of tests to assist in diagnosis.

**Treatment**

Type I lesions are treated conservatively with progressive range-of-motion and strength training. In some individuals, surgical debridement of the frayed labrum is required. Most labral injuries classified as Type II or above generally require surgical intervention. Several studies discuss the long-term outcome of arthroscopic surgical repair of Type II SLAP lesions. A study of 55 patients (mean age 39.7 years) revealed that 87% had a good or excellent functional outcome from arthroscopic SLAP repair. However, variables included age >40, and whether or not it was a workers’ compensation case.

A retrospective study described successful outcome of SLAP repair in a military group in which 76.9% reached activity level equal to or greater than pre-operative level and 96% were able to stay at active duty. A case series focused on elite athletes revealed an 88% return to pre-injury levels.

However, additional studies revealed less optimistic results. A prospective analysis of 225 patients with Type II SLAP tears concluded that arthroscopic SLAP repair provides a clinically and statistically significant improvement in shoulder outcomes although this was not associated with a reliable return to work in individuals age 36 or older. A 2012 analysis that focused on the elite athletes found that only 63% were able to return to the same level of competition.

Risk factors for a less than optimal outcome include age, concomitant medical problems, existence of a workers’ compensation claim, and concomitant shoulder injuries. Due to the complexity of this condition, prolonged physical therapy is often required and a detailed re-evaluation of the LEO before return to duty may be needed.

**SCAPULAR FRACTURES**

Scapular fractures are uncommon and usually associated with high-energy injuries. They are often (up to 50% of the time) associated with pulmonary contusion and injuries to other body parts. Between 80-90% of scapular fractures are nondisplaced and successfully heal with conservative treatment in 6-8 weeks.
Displaced scapular fractures, with or without surgery, may require up to 6 months for recovery. If the injury involves the glenoid fossa or the ipsilateral clavicle, and with greater displacement or multisystem trauma, a considerably longer period of treatment and rehabilitation may be required.\(^2,19,20,21,75\)

**PROXIMAL HUMERAL FRACTURES**

Proximal humeral fractures are more common in the elderly, but can occur in LEOs. Nondisplaced proximal fractures of the humerus may be treated non-operatively with an initial period of immobilization followed by early range-of-motion exercises. Initial immobilization may be achieved with a sling, shoulder immobilizer, or sling with an accompanying swathe. These devices provide varying degrees of constraint. If the fracture is stable, gentle range-of-motion exercises may begin after 7-10 days. Physical therapy may be initiated after 3 weeks and may allow a more expeditious return of upper-extremity function. Fractures that require closed reduction and percutaneous pinning for open reduction and internal fixation entail considerably longer periods of recovery. There is some ambiguity present in the literature as to when surgical treatment is required.\(^{16,17,18}\)

**BICEPS TENDINITIS AND TEARS**

The proximal biceps involve 2 separate heads and is one of the primary flexors of the forearm and assist with abduction of the shoulder. The long head of the biceps arises from the supraglenoid tubercle and inserts in the radial tuberosity on the medial part of the forearm. Ninety percent (90%) of all biceps tears occur in the proximal long head of the biceps, while a tear to the short head occurs least of all. Initial symptoms may include a cracking or popping feeling in the shoulder resulting in some strength loss and cosmetic deformity “Popeye” muscle. The injury is more common in middle-aged men with concomitant risk factors associated with chronic biceps tendinitis as well as chronic shoulder impingement. In addition, utilization of anabolic steroids has been identified as a risk factor for tears.

**Diagnostics**

MRI is not the most accurate tool for diagnosing a tear to the long head of the biceps. It may reveal thickening of the biceps tendon and assist in the diagnosis of tendinitis. The only precise diagnostic tool for a ruptured long head of the biceps is an arthroscope. Specialized physical examination tests, such as Speed’s and Yergason’s, are helpful in determining the presence of bicipital tendinitis and may assist in the diagnosis of a biceps tear.\(^2,76\)

**Recovery**

Persons with biceps tendinitis generally recover in 3-4 weeks and individuals with partial biceps tears generally recover in 6-8 weeks and may return to unrestricted work. Individuals requiring surgery need 4-6 months to recover before returning to unrestricted work.

**SHOULDER ARTHROPLASTY**

Shoulder replacement surgery has been used to treat severe shoulder fractures since the 1950s. Over the years, shoulder joint replacement has significantly improved and is now used to treat many painful shoulder conditions, most commonly arthritis. Individuals with higher BMIs tend to have poorer outcomes.

There are 5 types of shoulder arthroplasty: 1) total shoulder arthroplasty (TSA); 2) hemiarthroplasty (HA); 3) humeral resurfacing (HS); 4) total shoulder resurfacing (TSR); and 5) reverse total shoulder arthroplasty (RTSA). As with other types of arthroplasty, the primary purpose is pain relief. The goal of treatment is to improve activities of daily activities and most people eventually regain about two-thirds of normal shoulder motion after surgery. In general, surgeons restrict patients from doing things that put stress on
the joint, and as shoulder arthroplasty has been primarily performed in the elderly population, this seemed reasonable. More recently, studies have noted that individuals under age 65 seem to do as well with similar activity levels as older patients, suggesting that the concern that younger patients might be placing excessive demands on the prosthesis may not be as significant as initially thought.\textsuperscript{77,78}

It is important to consider the type of arthroplasty performed when considering post-surgical ability to return to normal activity level or return to duty. TSA has been shown to be associated with a higher rate of return-to-sport or preinjury activity than either RTSA or HA.\textsuperscript{79}

An additional study noted that resurfacing allowed the highest recommended rate of return-to-sports activities.\textsuperscript{80} However, in reviewing the performance outcomes, no contact activities were included in the return-to-sport assessment.

An additional study assessed surgeon preferences for return-to-sports activities.\textsuperscript{80} The study found that most surgeons allowed return to some sports post-arthroplasty, but recommended activities that did not involve high demands of the shoulder with respect to contact, high loads, risk of fall, or collision.

Studies have revealed varying outcomes based on the type of arthroplasty used. Many individuals were able to return to much higher activity levels than previously noted. There are presently two studies on shoulder arthroplasty applicable to LEOs’ level of return-to-duty fitness requirement.\textsuperscript{81,82} These studies measured arthroplasty outcome in the United States military, and found that about 50% of patients were able to return to preinjury level or return to military duty post arthroplasty. However, both studies were small (\(n = 19\),\textsuperscript{81} \(n = 26\))\textsuperscript{82} and the subjects predominantly male.

At the present, shoulder arthroplasty is successful in relieving pain and allowing the individual to return to a variety of light sporting activities, but it does not restore the shoulder to a point where the LEO can safely return to high-demand contact activities.

### Shoulder Instability

The term “shoulder instability” refers to primary shoulder dislocations, recurrent dislocations, and subluxations. Instability is the risk factor that predicts further shoulder recurrent dislocation, pain, loss of strength and subluxation, or any combination of these factors.\textsuperscript{2} The shoulder joint is the most frequently dislocated joint of the body and accounts for almost 50% of all joint dislocations. Most commonly, these dislocations are anterior (90-98%) and occur because of trauma. Posterior dislocations are less common (2-10%) and inferior dislocations the least common. A variety of complications often occur with these injuries – rotator cuff and axillary nerve injury being the most common.\textsuperscript{83} The prevalence of traumatic shoulder dislocation, expressed in terms of cumulative incident rate, was found to be 0.7% for men and 0.3% for women up to age 70.\textsuperscript{84}

### Anterior Shoulder Instability and Dislocation

The most common shoulder dislocation is anterior, accounting for more than 90% of dislocations. The highest incidents rates comprised men age 21-30, and women age 61-80.\textsuperscript{84} These populations have different mechanism of injury, as the young generally injured their shoulder from direct trauma such as in a field sport, while the injury in the elderly was usually a from fall on an outstretched arm. Concomitant injuries of the shoulder include rotator cuff tear and injury to the axillary nerve.

**Physical exam.** Initial exam findings include pain and the inability to move the arm. Often the shoulder is visibly displaced.
Diagnostic testing. X-rays are helpful in confirming a diagnosis and an MRI may be useful to assess soft tissue damage. If there is suspicion of a labral injury, an MRI arthrogram is considered to have higher sensitivity.

Treatment
Treatment of an acute first-time shoulder dislocation has long been controversial. For many years, this condition was treated conservatively with 3-4 weeks of immobilization and recommendations for physical therapy.85 However, in post-injury individuals treated conservatively high rates of recurrent shoulder instability with subluxation and/or dislocation as well as other sub-optimal outcomes were noted with multiple studies assessing the long-term complications of recurrent instability, glenohumeral arthritis, pain, and loss of motion.86,87

A) Risk of instability and recurrent dislocation. In individuals age ≤40, post-dislocation, the shoulder is less stable and more susceptible to recurrent instability with an increased risk of re-dislocation. For individuals treated with closed reduction, the rate of recurrent dislocation is high: 5% a year over 25 years7; 95% of recurrent dislocations occur within 5 years3; 13.3% a year for individuals less than 22 years of age5; and 56% recurrence in 2 years.6 By age 40, the rates flatten out to 1-1.1% a year.3,4 Additional studies and reviews echo these findings, emphasizing age at the time the dislocation occurs as a prime determinant. There are additional risks for delaying surgical treatment as recurrent dislocation increases bone loss and leads to early arthrosis as well as making surgical repair more technically difficult.5,11,88,89,90

B) Occupational risk post-dislocation. Individuals that are at the highest risk for recurrent instability were those less than 25 years of age, who participate in contact or collision sports or activities, and those who will use their arm at or above chest level in their occupation.

C) Factors that increase the risk of recurrent instability. Individuals with acute glenoid rim fracture of >5% (Bankart Lesion) are at increased risk of recurrent dislocation. Individuals with a type IV SLAP injury at the time of dislocation are at an increased risk (22%) for recurrent shoulder dislocation.91 The presence of a positive anterior apprehension test is indicative of an increased risk of re-dislocation.

D) Surgical vs. non-surgical treatment. Recent studies evaluating the effectiveness of arthroscopic and conservative treatment for dislocation have concluded that early arthroscopic stabilization is more predictable with lower recurrence rates in young athletic individuals. In young individuals, post-operative dislocation rates remain high for up to 2 years with recurrent dislocations diminishing thereafter. This however is affected by the type of dislocation divided among Baker Category 1-3. Individuals with a Baker 1 dislocation have an excellent prognosis and with less likelihood of dislocation. Baker Category 2 and 3 is associated with higher rates of dislocation and those individuals require restrictions for a longer period of time before their shoulder becomes stable.92 Individuals over age 40 with anterior shoulder dislocation may be treated with closed reduction primarily. However, for those who have persistent symptoms of instability, surgery is indicated. In individuals over age 40, recovery is generally good with a low rate of recurrence. Additional studies have evaluated different operative techniques including open stabilization for glenohumeral instability versus arthroscopic treatment. With recent advances, arthroscopic technique is now usually recommended; however, open surgery remains an acceptable option in selected individuals.

Posterior Shoulder Instability and Dislocation
Posterior dislocation of the shoulder accounts for 2-10% of all reported cases of shoulder dislocation. It is important to differentiate between traumatic dislocation and atraumatic instability as the outcomes differ. The most common mechanism of traumatic posterior dislocation is blunt force trauma when axial load is
applied to the adducted and internally rotated arm (e.g., being thrown headfirst from a bicycle). Atraumatic instability results from microtrauma such as repetitive overhead work, weightlifting, etc. Atraumatic dislocations result in recurrent instability and subluxation is more common. Both conditions are acutely disabling.

Physical Exam:
Physical findings include skin dimple posterior medial deltoid, Jerk test, Kemp test, and posterior drawer test. Specific physical examination tests include posterior load and shift and Jerk test and posterior apprehension test.

Diagnostic Testing:
There is no one best diagnostic image, but diagnosis is generally made by x-ray view. Diagnostic x-rays usually include 3 views with an axillary or West Point and/or supraspinatus outlet view. An MRI is helpful for evaluation of soft tissue findings or cartilaginous abnormalities especially with instability. CAT scans provide better imaging for any bony injuries such as reverse Hill-Sachs lesion.

Treatment:
Traumatic Posterior Shoulder Dislocation. The frequency of recurrent dislocation or instability from a traumatic posterior shoulder dislocation is 20.6% within 5 years (17.7% in the first year), Because of this, surgical treatment is preferred. This is especially true for individuals less than 40 years old. There are important factors that should be considered that help to determine the treatment recommendations:

1. Traumatic posterior dislocations that result from a seizure (all causes) require surgery.
2. Traumatic posterior dislocation from a fall or related to an MVA may be treated conservatively. Factors that increase the risk of recurrent dislocation include age <40 are a large reverse Hill-Sachs lesion >1.5cm³ and should be considered high risk for recurrent dislocation and require surgery. A traumatic posterior shoulder dislocation may be treated with conservative therapy consisting of 4 weeks of immobilization, followed by 4-6 weeks of physical therapy and rehabilitative exercise. Contact activity is precluded until 18-24 weeks.
   LEOs who experience recurrent shoulder pain, instability or functional limitations after a course of conservative treatment over 3-6 months may be considered candidates for surgery. Both arthroscopic and open procedures are used.
3. Recurrent posterior shoulder dislocation – individuals with recurrent posterior shoulder dislocation are very likely to require surgery. For certain individuals who can be identified as low risk (age >40, and small Hill-Sachs lesion <1.5cm³), a trial of physical therapy may be considered appropriate.

Recovery post-surgery generally requires 6-9 months and is reasonably assessed with findings of painless range of motion without symptoms of instability and suitable strength of at least 80% compared to the contralateral shoulder.

Atraumatic Posterior Shoulder Instability
Individuals with atraumatic instability have a much higher (80%) success rate with physical therapy. LEOs with atraumatic posterior shoulder instability can be treated conservatively. Those with adequate active range of motion can return to duty in 6 months following a successful return to full-training activities. Those with atraumatic multidirectional instability that does not respond to conservative care generally require surgery.
Inferior Shoulder Dislocation
This is a rare shoulder dislocation with an incidence of about 1 in 200 dislocations. The mechanism of injury is usually blunt trauma or a fall from heights. The primary complications are axillary nerve palsy and rotator cuff tear. This dislocation can be treated non-surgically if reduction is easily obtained. However, in failed reduction, surgical treatment is required. Recovery can be prolonged, requiring up to 1-2 years.

Chronic Shoulder Instability
Chronic shoulder instability is generally the result of recurrent dislocation, multiple shoulder injuries, genetics, or repetitive trauma. Instability may be anterior, posterior or multidirectional. Chronic shoulder instability can be divided into two general categories: traumatic and atraumatic, with very different causes. Traumatic shoulder dislocation(s) may lead to instability, but many individuals have never had frank dislocation. There can be increased laxity secondary to trauma or as the result of repetitive overhead sport or occupational activities. Swimming, tennis, and volleyball are among the sports requiring repetitive overhead motion that can stretch out the shoulder ligaments and result in a painful unstable shoulder. Atraumatic shoulder instability is usually multidirectional and commonly occurs in individuals with generalized hyperlaxity due to connective tissue disorders, weak rotator cuff muscles, small or flat glenoid fossa, and several other diagnoses.

Adhesive Capsulitis (Frozen Shoulder)
Adhesive capsulitis is a painful and disabling disorder related to immobilization/disuse. It can also occur spontaneously in some persons (notably diabetics) and involves the gradual onset of shoulder stiffness and pain caused by tightening of the joint capsule that occurs as the area around the shoulder joint contracts and thickens. The condition is thought to be caused by injury or trauma to the shoulder or may have an autoimmune component and can be bilateral. Risk factors include hypothyroidism, connective tissue disease, cerebrovascular accident, and cardiac and lung disease. Signs and symptoms typically begin gradually and progressively worsen with time and then resolve, usually within 1-3 years from onset. This condition is more prevalent in individuals aged 40-60 and males more so than females.

Adhesive capsulitis generally occurs in 3 stages:
1. **Freezing stage.** Any movement of the shoulder causes pain, and the shoulder’s range of motion starts to become limited.
2. **Frozen stage.** Pain may begin to diminish during this stage. However, the shoulder becomes stiffer, and using it becomes more difficult.
3. **Thawing stage.** The range of motion in the shoulder begins to improve. Pain is usually constant, worse at night, as well as with cold weather.

Diagnostics
Adhesive capsulitis is primarily a clinical diagnosis, although imaging may be used to exclude other causes of shoulder pain (e.g., fracture, dislocation, rotator cuff tear) and depict findings that increase confidence in clinical diagnosis. Arthrography is usually regarded as the gold standard for imaging diagnosis.

Treatment
Non-surgical treatment for frozen shoulder includes range-of-motion exercises, oral and injected medications, and manipulation under anesthesia. Surgical treatment for patients who do not respond adequately to non-surgical measures involves lysis of adhesions.23,93
Appendix D: Assessment Form for Treating Physician

Patient Name: _________________________________________________________________

Shoulder Injury or Illness Type: __________________________________________________

Date of Injury, if any: ___________________________

Mechanism of Injury (contact, non-contact, fall, motor vehicle accident, work-related, etc.):
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________

Are there any other related injuries (cervical, thoracic spine, elbow, wrist, tendon, soft tissue, etc.)? Please describe:
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________

Method of diagnosis (check all that apply):
   Clinical exam
   Imaging
   Operative findings

Pertinent diagnostic findings _________________________________________________________

Treatment:  Operative   Non-operative

Description of treatment plan, including surgery dates:
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________

List of current medications related to injury:
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________

Instability of shoulder on exam?   Yes   No
If “Yes,” please describe _____________________________________________________________
_____________________________________________________________________________________

Normal flexion/abduction strength?   Yes   No

Shoulder range of motion:
  Flexion: _____ degrees
  Abduction: _____ degrees
  External Rotation: _____ degrees
  Internal Rotation: _____ degrees
Constant/Oxford/DASH Score, if available ____________________
WOSI Score, if available ____________________

Does your patient have any further therapy and/or treatment needs?  □ Yes  □ No
If “Yes,” please describe type and expected duration of therapy and/or treatment needs:
_____________________________________________________________________________________
_____________________________________________________________________________________

If “No,” is your patient at maximum medical improvement (MMI)?  □ Yes  □ No

Can your patient perform the following tasks?:
Crawl under obstacles:  □ Yes (unrestricted)  □ Yes (with limitations)  □ Unable to Perform
Climb a fence:  □ Yes (unrestricted)  □ Yes (with limitations)  □ Unable to Perform
Climb a ladder:  □ Yes (unrestricted)  □ Yes (with limitations)  □ Unable to Perform
Lifting, pushing or pulling with involved limb:
□ Yes (unrestricted)  □ Yes (with limitations)  □ Unable to Perform
Grip and hold objects:  □ Yes (unrestricted)  □ Yes (with limitations)  □ Unable to Perform
Do push-ups:  □ Yes (unrestricted)  □ Yes (with limitations)  □ Unable to Perform
Do overhead work:  □ Yes (unrestricted)  □ Yes (with limitations)  □ Unable to Perform

Does your patient have any other activity restrictions?  □ Yes  □ No
If “Yes,” please describe restrictions and if these are permanent or temporary restrictions:
_____________________________________________________________________________________
_____________________________________________________________________________________

Provide additional information, not included above, that may be helpful to the police physician.
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________

Signature of physician  Date

Printed name of physician  Phone number  Fax number
APPENDIX E: EXAMPLES OF ESSENTIAL JOB FUNCTIONS

**Physical EJFs from California POST**
- Running in pursuit of subjects up to 500 yards. Speed is important in up to 90% of incidents
- Balancing and walking several yards at 6-10 feet about ground on top of walls or other surfaces which are frequently only 6 inches wide
- Climbing 6-foot fences, 2-5 flights of stairs, 20-foot ladders, and 36-foot embankments where speed is required 33% of the time
- Jumping/Hurdling/vaulting across 3-5-foot ditches, down from 6-foot walls and over 3-foot shrubs. Speed is required 90% of the time. One-third of these events occur from a stationary position.
- Moving incapacitated persons without assistance for distances averaging 40 feet. Speed is critical in 40% of instances
- Pushing vehicles, dragging and pulling objects averaging 60 pounds without assistance where speed is required 50% of the time
- Crawling/crouching/squatting
- Subduing combative subjects (defensive tactics)

**Physical EJFs from North Carolina Justice Academy**
These are job functions expressed as activities that can be objectively tested, minimizing redundancy and injury risk to testing subjects:
- Run after a fleeing subject (maximum 406 feet)
- Run up and down stairs (maximum 3 floors)
- Crawl under an obstruction
- Jump across obstacles, e.g., ditch, hole, etc. (maximum 4 feet)
- Jump down from elevated surface (maximum 5 feet)
- Jump over obstacles, e.g., road barrier, hedge, etc. (maximum 3 feet)
- Climb or pull oneself over obstacle, e.g., wall, fence, etc. (maximum 5 feet)
- Jump over obstacles while running
- Pull/drag a person/animal
- Drag by yourself an immobile adult
- Lift while in a stationary position a heavy object or person
- Hold a person by oneself to prevent or control his/her movements (maximum 3 minutes, 200 pounds, 72 inches)
- Physically struggle with person by oneself (maximum 3 minutes, 200 pounds, 72 inches)
- Subdue person resisting arrest
- Grip person tightly to prevent escape/control movement
- Perform strenuous physical activities in a series, e.g., sprint, run upstairs, wrestle, pull, carry, etc.
- Perform duties wearing full duty gear
- Perform duties wearing body armor for extended periods of time
- Work in a confined, closed area
- Defend oneself from position on ground
References


47. Hegenhusen J. Which physical examination tests provide clinicians with the most value when examining the shoulder? Update of a systematic review with meta-analysis of individual tests. *British J Sports Med*. 2012;46(14):964-78.


