

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF INDUSTRIAL ACCIDENTS

Shoulder Injury Treatment Guideline

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INTRODUCTION:

This clinical guideline has been created to consistently improve health care services for injured workers by outlining the appropriate evaluation and treatment processes for the management of work-related shoulder injuries. The guideline should be used as a tool to guide health care providers of different professional disciplines to provide quality care to injured workers. The guideline is not intended to be a substitute for appropriate medical judgment, and is written to be broad enough to allow for a wide range of diagnostic and treatment modalities, and to purposely allow for philosophical and practice differences among professional disciplines of health care practitioners who provide care to injured workers. It is expected that approximately 10% of cases may fall outside of this guideline and may be reviewed and approved on a case-by-case basis. If objective clinical improvement is delayed or slower than expected, the treating provider must justify the necessity of continued care with a valid clinical rationale and supporting, objective clinical findings. Timeframes for specific interventions commence once treatments have been initiated, not on the date of injury.

A. GENERAL GUIDELINE PRINCIPLES AND BEST PRACTICES

Benefit from Injections - Minimum of 50% pain reduction as measured by a numerical pain index scale, for at least 3 weeks, and documented increased functional improvement such as improvement in activities of daily living and/or decreased work restrictions. Benefit must be clearly documented.

Delayed Recovery - For those patients who are failing to make expected progress 6 to 12 weeks after an injury, it may be appropriate to consider initiating interdisciplinary rehabilitation treatment, referral for an ergonomic review, a psychological evaluation, and setting a vocational goal. Co-morbid conditions that may delay recovery should be addressed.

Maximum Duration - If objective functional gains are being achieved, occasional follow-up visits may be justified after the patient reaches the maximum duration recommendation to reinforce exercise patterns or to reach the functional goal.

Operative Interventions must be based upon positive correlation of objective clinical findings, clinical course, and diagnostic tests. Subjective reports of pain and function should be considered and given relative weight when the pain has anatomic and physiologic correlation. A conservative course of treatment should be performed before considering operative intervention, unless there are clear indications for surgical intervention as set forth in this guideline. All treatment must be patient specific taking into consideration the severity of the shoulder injury, co-morbidities, and job duties.

Positive Patient Response results are defined primarily as functional gains that can be objectively measured. Objective functional gains include, but are not limited to, positional tolerances, range-of-motion (ROM), strength, endurance, activities of daily living, cognition, psychological behavior, and efficiency/velocity measures which can be quantified.

Re-Evaluate Treatment Every 3 to 4 Weeks and if treatment or modality is not producing positive results, the treatment should be either modified or discontinued. If symptoms persist for more than 4 to 6 weeks, referral for specialty care may be indicated.

Return to Work as soon as medically appropriate, and functional restoration in a timely basis, should be prime goals in treating occupational injuries.

Therapeutic Interventions - Active therapy requires supervision from a therapist or licensed health care provider. Patients should be instructed to continue active therapies at home. Follow-up visits to reinforce and monitor progress and proper technique are recommended. Passive therapy modalities can be effective during the early phases of treatment as an adjunct to active therapies. It is expected that the frequency of visits will decrease as the patient continues to achieve functional gains.

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF INDUSTRIAL ACCIDENTS

Shoulder Injury Treatment Guideline

PAGE TWO

B. INITIAL ASSESSMENT

1. History of Present Injury, Past History, and Physical Examination

This guideline attempts to distinguish between soft tissue shoulder injuries which warrant early aggressive care and evaluation, from those that do not, i.e., those in which special studies and referral are not warranted during the first 4-6 weeks when spontaneous recovery is expected. Red flags may include an acute traumatic structural injury such as fracture or dislocation, and signs and symptoms of systemic disease or life-threatening conditions that involve shoulder pain including infection, tumor, progressive neurological or vascular compromise, cardiac conditions, and subdiaphragmatic disease process involving the referral of pain to the shoulder. Co-morbid conditions should be aggressively evaluated. Pain in the shoulder may be referred from the neck and as such a comprehensive history and physical exam of the neck is recommended. In patients with a history of injury who experience prolonged or excessive pain and changes in skin color, temperature, and/or swelling in the affected area, it is reasonable to obtain a pain management consult to rule out complex regional pain syndrome.

2. Diagnostic Imaging

Diagnostic Imaging should not be used as a general screening tool. Tests can be used to confirm clinical impressions and clarify reasons for unexplained shoulder complaints.

Criteria for Diagnostic Imaging and Testing Procedures include:

- Physiologic evidence of tissue injury or neurovascular dysfunction;
- Failure to progress in a functional restoration program intended to avoid surgery;
- Need for visualization of the anatomy prior to an invasive procedure.

Plain Radiograph indications:

- Acute shoulder trauma and pain, rule out fracture or dislocation.

Computerized tomography (CT) indications:

- May be used if MRI is contra-indicated/inaccessible;
- Suspected occult fracture.

MRI indications:

- Shoulder trauma and/or pain with sustained dropped arm or significant weakness of rotator cuff without improvement 72 hours post injury;
- Subacute shoulder pain, suspect instability/labral tear, suspect incomplete/complete distal biceps tendon tear. Pain and dysfunction unresponsive to 4 weeks of conservative care with exam findings indicating potential derangement/structural damage;
- Repeat MRI is not routinely recommended and should be reserved for a significant change in symptoms and/or findings suggestive of significant pathology.

MRI or CT Arthrogram indications:

- Generally not recommended. May be useful in evaluation of recurrent rotator cuff tears; and when the MRI is negative and labral tears and/or chondral lesions are strongly suspected in patients under age 30 and surgical repair is being considered. CT arthrogram may be indicated in evaluation of rotator cuff injury in patients who have a contraindication for MRI.

Ultrasound indications:

- Those who cannot have MRI studies. Useful for detection of rotator cuff tears, biceps pathologies, cysts, and soft tissue mass.

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF INDUSTRIAL ACCIDENTS

Shoulder Injury Treatment Guideline

PAGE THREE

C. SPECIFIC DIAGNOSIS, TESTING, AND TREATMENT PROCEDURES

1. Acromioclavicular Joint Sprains/Dislocations

An acute acromioclavicular (AC) joint injury is frequently referred to as a shoulder separation. There are six classifications of AC joint separation which are numbered Type I to Type VI and based upon the extent of ligament damage and bony displacement:

- Type I Sprain of the AC ligament and capsule. X-ray usually normal.
- Type II Sprains consisting of a ruptured AC ligament and capsule with incomplete injury to the coracoclavicular (CC) ligament, resulting in mild AC joint subluxation. X-ray shows clavicle slightly elevated.
- Type III Dislocation of the clavicle above the acromion with complete tear of the AC ligament and/or CC ligaments.
- Type IV Dislocation consisting of a displaced clavicle that penetrates posteriorly through or into the trapezius muscle.
- Type V Dislocation consisting of complete separation of the AC and CC ligaments and dislocation of the acromioclavicular joint with a large coracoclavicular interval.
- Type VI Dislocation consisting of a displaced clavicle that penetrates inferior to the coracoid.

Types I and II are primarily treated non-operatively. Type III is usually treated non-operatively but may be operative, especially if the shoulder is subject to heavy physical demands including overhead activities. Types IV, V, and VI usually require operative intervention.

Non-operative Treatment Procedures:

Therapeutic rehabilitation interventions: maximum 12 sessions. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal. In some cases, immobilization is recommended for up to 6 weeks for Type I-III AC joint separations. Acromioclavicular Joint Dislocation-AC separation: Recommend at least 3 months conservative care.

Surgical Indications:

Type III AC joint dislocations usually do not require operative intervention. Cosmetic deformity at the joint is expected, but return to normal or near-normal function is common. Operative intervention may be considered when functional deficits interfere with activities of daily living and/or job duties after three to four months of active patient participation in non-operative therapy. For patients with particularly high physical demands on their shoulders, or who perform a lot of overhead activities in their jobs, immediate orthopedic consultation with operative intervention as early as two weeks from the date of injury may be considered. With a Type IV-VI AC joint injury, an early orthopedic operative consultation is recommended.

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF INDUSTRIAL ACCIDENTS

Shoulder Injury Treatment Guideline

PAGE FOUR

2. Adhesive Capsulitis/Frozen Shoulder Disorder

Non-operative Treatment Procedures:

In patients demonstrating the clinical condition of adhesive capsulitis, a delay in advanced imaging should be considered. Mild adhesive capsulitis is generally treated with anti-inflammatories, icing, and physical therapy. Strengthening is not commenced until approximately 80% of motion is restored as strengthening a frozen shoulder worsens the condition. For patients with a significant loss of motion and pain early on, an intra-articular cortisone injection done under x-ray or ultrasound guidance is beneficial, followed by active physical medicine.

- i. Early therapeutic rehabilitation interventions: maximum 24 sessions and contingent upon patient progress. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.
- ii. Subacromial bursal and/or glenohumeral steroid injections. If steroid injections are deemed appropriate and necessary, active physical medicine or a home exercise program must follow. Maximum 3 injections in one year at least 8 to 12 weeks apart, when functional benefits are demonstrated with each injection. Benefits of each injection must be documented noting the extent and duration of positive response before a subsequent injection is provided.
- iii. Suprascapular nerve blocks have not shown a clear long-term benefit however, blocks may be appropriate for patients when pain is not well-controlled and injections improve function. Time to produce effect is one block which should demonstrate increased ability to perform exercises and/or range-of-motion. Maximum 3 injections per year at least 8 to 12 weeks apart. Benefits of each block must be documented noting the extent and duration of positive response before a subsequent block is provided.
- iv. Hyaluronate injections are not recommended.

Surgical Indications:

Surgery may be considered when functional deficits interfere with activities of daily living and/or job duties after 6 months of active patient participation in non-operative therapy. Surgery may also be considered in patients who are not making functional achievements with therapeutic interventions, or have worsening symptoms at the 3 month follow-up visit.

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 24 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF INDUSTRIAL ACCIDENTS

Shoulder Injury Treatment Guideline

PAGE FIVE

3. Bicipital Tendon Disorders

Disorders may include: primary bicipital tendonopathy, secondary bicipital tendonopathy, subluxation of the biceps tendon, and partial or complete tear of the tendon.

Non-operative Treatment Procedures:

- i. Therapeutic rehabilitation interventions: maximum 12 sessions. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.
- ii. Biceps tendon sheath or subacromial steroid injections may be therapeutic, as well as intra-articular cortisone injections. One injection should provide demonstrable functional benefit. Maximum 3 injections per year at the same site, at least 8 to 12 weeks apart, when functional benefits are demonstrated with each injection. Benefits of each injection must be documented noting the extent and duration of positive response before a subsequent injection is provided. Consider ultrasound guidance when injecting the biceps tendon sheath.

Surgical Indications:

- i. Acute Distal Biceps Tendon Rupture, Complete Tear, or Incomplete Tear greater than 50%: Normally requires urgent operative repair and as such, requests for imaging (e.g., MRI, diagnostic ultrasound) to confirm tear or discern percentage of tendon torn should be approved expediently without requiring conservative care first. Distal biceps injury should be suspected and imaging/referral achieved expediently if injury involves sudden force through elbow, pain to palpation at insertion of biceps or distal third of muscle, and/or pain or weakness with resisted supination. Due to swelling and residual aponeurosis deformity of distal biceps muscle may not be observed in the first few days after injury thus timely diagnosis requires high index of suspicion and low threshold for imaging. Distal biceps tendon ruptures caused by an injury should usually be repaired in the working population.
- ii. Acute Proximal Long Head Biceps Tendon Rupture: Non-operative treatment is often successful, especially if the rupture is in the nondominant arm. However, operative intervention may be indicated for young patients, manual laborers, or others who require forceful supination or elbow flexion.
- iii. Bicipital Tendonitis: Surgery may be considered when functional deficits interfere with activities of daily living and/or job duties after 12 weeks of active patient participation in non-operative therapy.
- iv. Subluxation of Bicipital Tendon: Operative treatment of the bicipital tendon may be considered when functional deficits interfere with activities of daily living and/or job duties after 12 weeks of active patient participation in non-operative therapy. If there is a concomitant rotator cuff tear, surgery for the unstable biceps may be considered more acutely, according to the Rotator Cuff Guideline. Long head biceps tendon instability is often associated with subscapularis rotator cuff tear. Dislocation of the biceps tendon tend to do poorly with conservative treatment and frequently require surgery.

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF INDUSTRIAL ACCIDENTS

Shoulder Injury Treatment Guideline

PAGE SIX

4. Brachial Plexus and Shoulder Peripheral Nerve Injuries

Electromyography (EMG) studies should be performed no sooner than 4 weeks following injury or description of symptoms. Studies performed early may be falsely negative. Serial studies may be indicated if initial studies are negative and may also be useful for gauging prognosis. Referral to a specialist may be appropriate when there is slow patient progress.

a. Brachial Plexus Injuries:

Non-operative Treatment Procedures:

In closed injuries, observation is favored. Repeat electrophysiologic studies may be helpful to assess or monitor recovery. Utilization of ultrasound and cold/heat modalities may aggravate the nerve injury. Therapeutic rehabilitation interventions: maximum 12 sessions. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

Surgical Indications:

In open injuries, acute exploration may be indicated if nerve discontinuity is visualized. Surgery may be considered when functional deficits interfere with activities of daily living and/or job duties after active participation in non-operative therapy has failed to produce functional improvement. In closed injuries, if functional deficits continue to be documented after 3 to 4 months of active patient participation in non-operative therapy, then exploration may be warranted and an operative consultation should be considered. Patients with progressive weakness or a loss of function post-injury should be referred for operative consultation immediately.

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

b. Axillary Nerve:

Non-operative Treatment Procedures:

Therapeutic rehabilitation interventions: maximum 12 sessions. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal. Utilization of ultrasound and cold/heat modalities may aggravate the nerve injury.

Surgical Indications:

Surgery is usually not necessary but may be considered when functional deficits interfere with activities of daily living and/or job duties after 3 months of active patient participation in non-operative therapy and with EMG/NCV documentation of ongoing denervation and loss of function. Surgery for quadrilateral space syndrome is not usually necessary. Indications may include 6 months of conservative treatment with persisting functional deficits, a positive arteriogram, identification of a mass in the quadrilateral space, and/or point tenderness at the posterior quadrilateral space.

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF INDUSTRIAL ACCIDENTS

Shoulder Injury Treatment Guideline

PAGE SEVEN

c. Long Thoracic Nerve:

Non-operative Treatment Procedures:

Therapeutic rehabilitation interventions: maximum 12 sessions. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal. Utilization of ultrasound and cold/heat modalities may aggravate the nerve injury.

Surgical Indications:

Laceration of the nerve and progressive loss of function are potential indications for prompt operative consultation with potential for operative intervention. In cases where there is no obvious laceration or progressive loss of function, surgery may be considered when functional deficits interfere with activities of daily living and/or job duties after 9 to 12 months of active participation in non-operative therapy. Surgical consultation may be appropriate for these patients, but surgery is not typically offered until there is a failure of one year of conservative management.

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

d. Musculocutaneous Nerve:

Non-operative Treatment Procedures:

Therapeutic rehabilitation interventions: maximum 12 sessions. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal. Utilization of ultrasound and cold/heat modalities may aggravate the nerve injury.

Surgical Indications:

Laceration of the nerve, suspicion for post-operative entrapment, and/or progressive loss of function are indications for prompt operative intervention. In cases where there is no obvious laceration, post-operative entrapment, or progressive loss of function, surgery may be considered when functional deficits interfere with activities of daily living and/or job duties after 4 to 6 months of active patient participation in non-operative therapy. Specialty consultation may be appropriate for these patients.

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

e. Spinal Accessory Nerve:

Non-operative Treatment Procedures:

Therapeutic rehabilitation interventions: maximum 12 sessions. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal. Utilization of ultrasound and cold/heat modalities may aggravate the nerve injury.

Surgical Indications:

Laceration of the nerve and progressive loss of function are potential indications for prompt operative intervention. Surgery may be considered when functional deficits interfere with activities of daily living and/or job duties after 4 to 6 months of active participation in non-operative therapy. Specialty consultation may be appropriate for these patients.

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF INDUSTRIAL ACCIDENTS

Shoulder Injury Treatment Guideline

PAGE EIGHT

e. Spinal Accessory Nerve, CONTINUED:

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

f. Suprascapular Nerve:

Non-operative Treatment Procedures:

Resolution of symptoms usually occurs within 6 to 12 months of diagnosis with non-operative treatment in the absence of lesions such as a cyst. Therapeutic rehabilitation interventions: maximum 12 sessions. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal. Utilization of ultrasound and cold/heat modalities may aggravate the nerve injury. For injections, refer to **Section D. 3. INJECTIONS**.

Surgical Indications:

Operative decompression may be warranted depending upon the presence of a ganglion cyst, results of the electrophysiologic studies, and/or absence of improvement with conservative management. Large paralabral cysts may be treated by drainage under CT or ultrasound guidance followed by a cortisone injection before surgical intervention. In cases without cysts or other operative diagnoses, non-operative treatment may be tried for 3 to 6 months. A positive EMG should confirm entrapment/ neuropathy prior to a suprascapular nerve release. However, a negative EMG should not be the sole diagnostic tool to rule out the diagnosis of suprascapular neuropathy. Diagnostic blocks may be considered before the surgical repair.

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

5. Bursitis/Rotator Cuff Tendonopathy/Tendinopathy of the Shoulder And Calcifying Tendonitis

Non-operative Treatment Procedures:

- i. Therapeutic rehabilitation interventions are the mainstay of treatment: maximum 12 sessions. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.
- ii. Steroid injections may be therapeutic. One injection must produce a beneficial effect. A maximum of 3 injections at the same site per year, at least 8 to 12 weeks apart, are allowed when functional benefits are demonstrated with each injection. Benefits of each injection must be documented noting the extent and duration of positive response before a subsequent injection is provided.

Surgical Indications:

Not commonly indicated for bursitis or tendonopathy. Surgery for Calcifying Tendonitis is not commonly indicated but may be appropriate when functional deficits interfere with activities of daily living and/or job duties after 3 to 4 months of active patient participation in non-operative therapy.

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF INDUSTRIAL ACCIDENTS

Shoulder Injury Treatment Guideline

PAGE NINE

6. Fractures

There are five common types of shoulder fractures, as listed below.

a. Clavicular Fracture:

Non-operative Treatment Procedures:

Adults with non-displaced or minimally displaced fractures are managed by closed techniques and do not require surgery.

Medical office visits: maximum 5 visits.

Surgical Indications:

Adults with shortening of greater than 2 cm and/or significant displacement and /or comminution: Open fractures, vascular or neural injuries requiring repair, bilateral fractures, ipsilateral scapular or glenoid neck fractures, scapulothoracic dislocations, flail chest and non-union (displaced-closed fractures that show no evidence of union after 4 to 6 months). A Type II fracture/dislocation at the AC joint where the distal clavicular fragment remains with the acromion and the coracoid, and the large proximal fragment is displaced upwards is another indication for surgery. Completely displaced mid-clavicular fractures may be an indication for operative repair. Initial operative repair may be considered for patients who desire excellent shoulder function for sport or job activities and/or those with approximately 2 cm or greater shortening of the clavicle.

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

b. Proximal Humeral Fractures:

Non-operative Treatment Procedures:

Non-displaced and minimally displaced fractures are generally treated conservatively with a sling. Home exercises are essential for recovery. Therapeutic rehabilitation interventions: maximum 12 sessions. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

Surgical Indications:

Greater tuberosity fractures with 5mm of displacement usually require operative fixation; two-part fractures are repaired according to the surgeon's preference; three and four-part fractures frequently require operative treatment.

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

c. Humeral Shaft Fractures:

Non-operative Treatment Procedures:

Most isolated humeral shaft fractures can be managed non-operatively. Treatment usually involves a fracture brace. Interval evaluations are done to assess for fracture position, healing and neurovascular status. Therapeutic rehabilitation interventions: maximum 12 sessions. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

Surgical Indications:

Open fractures; significantly displaced fractures with inability to achieve satisfactory alignment with closed reduction and splinting or bracing; delayed or nonunion following 3-6 months of non-operative treatment; associated forearm or elbow fracture; burned upper extremity; associated paraplegia; multiple injuries; a radial nerve palsy which presented after closed reduction; pathologic fracture related to an occupational injury; and/or inability to perform basic activities of daily living while following conservative care.

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF INDUSTRIAL ACCIDENTS

Shoulder Injury Treatment Guideline

PAGE TEN

c. Humeral Shaft Fractures, CONTINUED:

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

d. Scapular Fractures:

Non-operative Treatment:

Non-displaced acromial, coracoid, glenoid, glenoid neck and scapular body fractures may all be treated with the use of a shoulder immobilizer. Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

Surgical Indications:

Displaced acromial fractures; displaced glenoid fractures; displaced scapular body fractures in some circumstances; displaced fractures of the scapular neck and the ipsilateral clavicle.

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

e. Sternoclavicular Dislocation/Fracture:

Non-operative Treatment Procedures:

Anterior dislocations of the sternoclavicular joint usually do not require active treatment; however, symptomatic posterior dislocations should be reduced in the operating room under general anesthesia.

Surgical Indications:

Surgery is indicated upon failure of closed reduction. Symptomatic posterior dislocations should be reduced in the operating room under general anesthesia. It is recommended to have a thoracic surgeon available during the operative reduction.

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

7. Impingement Syndrome

Treatment approach is conservative and may include a steroid injection. An injection maybe indicated early as part of the conservative treatment if symptoms are significant. If there is no improvement, an MRI is indicated. If there is clear evidence of impingement, a subacromial decompression can be beneficial.

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF INDUSTRIAL ACCIDENTS

Shoulder Injury Treatment Guideline

PAGE ELEVEN

7. Impingement Syndrome, CONTINUED:

Non-operative Treatment Procedures:

- i. Therapeutic rehabilitation interventions: maximum 12 sessions. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.
- ii. Subacromial space injection may be therapeutic. One injection should produce a beneficial effect. A maximum of 3 injections at the same site per year, at least 8 to 12 weeks apart, are allowed when functional benefits are demonstrated with each injection. The use of fluoroscopic or ultrasound guidance should be considered to ensure proper needle placement for a subacromial injection, especially if not performed by a sports medicine or shoulder trained orthopedist. An AC joint injection should be performed with ultrasound or radiographic guidance because of the small capacity of the joint. An injection into the AC joint is diagnostic of the condition and may help to determine the value of surgery if the patient fails conservative management. If there is no response to a fluoroscopic or ultrasound guided steroid/xylocaine injection (Impingement Test), surgery should not be performed as a non-response makes impingement syndrome unlikely as the cause of the patient's pain.
- iii. If the non-operative program is not working after 12 weeks, an evaluation for additional pathology (such as rotator cuff tear or biceps tendonitis) is recommended.

Surgical Indications:

When functional deficits interfere with activities of daily living and/or job duties after 3 to 6 months of active patient participation in non-operative therapy, surgery may restore functional anatomy and reduce the potential for repeated impingement.

Subacromial decompression - Patient should have positive Neer and Hawkins impingement signs. Typically indicated when a concomitant rotator cuff repair is being performed. Also indicated in conjunction with an arthroscopic distal clavicle excision, and when an arthroscopic capsular release is being performed for adhesive capsulitis. Occasionally, indicated for secondary impingement due to primary glenohumeral instability.

Mumford Procedure/Distal Clavicle Excision/AC Joint Resection - indicated when the worker has point tenderness at the AC joint on physical examination, and when an ultrasound guided injection into the AC joint eliminates the pain in that area (diagnostic test). X-ray or MRI findings of "AC joint arthritis" alone is not sufficient.

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

8. Rotator Cuff Tear

Repair of rotator cuff is indicated for significant tears that result in pain and impair activities by causing weakness of arm elevation or rotation, particularly in young workers. Small tears, 50% or less, in the older population should generally be treated conservatively with the understanding that this treatment is expected to dissipate the symptoms. Full thickness tears in the working population, especially under age 60 is usually an indication for repair.

Non-operative Treatment Procedures:

Treatment of partial rotator cuff tears in the working population should initially be treated non-operatively. It is reasonable to attempt non-operative management for 6 weeks, particularly in cases with insidious onset or chronic presentation. Continued therapeutic intervention after 6 weeks is contingent upon documented functional improvement. Rest and therapeutic rehabilitation interventions to include ROM exercises outlined in **Section D**.

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF INDUSTRIAL ACCIDENTS

Shoulder Injury Treatment Guideline

PAGE TWELVE

8. Rotator Cuff Tear, CONTINUED:

NON-OPERATIVE TREATMENT PROCEDURES. Therapeutic rehabilitation interventions: maximum 12 sessions. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

Surgical Indications:

- i. Complete (Full-thickness) acute/traumatic tears: Full thickness tears confirmed by MRI and clear clinical findings such as the drop arm test and weakness with elevation may require surgery within 2 to 6 weeks post-injury to optimize surgical outcome. Considerations for surgical intervention include but are not limited to the length of time since the injury, the amount of muscle or tendon that has retracted, the level of fatty infiltration, the quality of the tendon, patient age, smoking history, presence of diabetes, customary activities of daily living and work activities; and expected patient compliance with pre-operative and post-operative treatment plan as well as expected outcome.
- ii. Partial thickness tear: If no increase in function is observed after 6 to 12 weeks of conservative treatment, an operative consultation is indicated. For partial thickness rotator cuff tears and small full thickness tears presenting primarily as impingement, surgery is reserved for cases with limited functional improvement after a 3-6 month period of conservative therapy. Three months is adequate if treatment has been continuous, six months if treatment has been intermittent. Surgery is not indicated for patients with mild symptoms or those whose activities are not limited. Patients may need pre-operative therapy to increase ROM. Surgery for partial thickness tears has variable results and should be performed early in younger active patients. Many patients with partial tears and good ROM and strength recover well without surgery.

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

Surgical Procedures which may be associated/indicated with a Rotator Cuff Repair:

- Subacromial Decompression - When there is evidence of trauma or a spur on the acromion an Arthroscopic Subacromial Decompression is beneficial. Avoid a decompression in massive tears and traumatic tears without evidence of impingement unless absolutely necessary;
- Mumford Procedure/Distal Clavicle Excision/AC Joint Resection - Not necessary for rotator cuff repair unless there is clearly painful pathology on examination or spur impingement with relief of pain after AC injection with cortisone. Avoid unless absolutely necessary. Indicated when the worker has point tenderness at the AC joint on physical examination, and when an ultrasound guided injection into the AC joint eliminates the pain in that area (diagnostic test). X-ray or MRI findings of "AC joint arthritis" alone is not sufficient;
- Labral Repair/SLAPS - Avoid in rotator cuff repair as this procedure may complicate the recovery and lead to stiffness. Debridement of the labrum is sufficient. If the biceps anchor is compromised, a biceps tenodesis can be done;
- Biceps Tears, Subluxation or Anchor issues (SLAPS) - Treated by tenodesis or debridement depending on severity. In large tears or those involving the subscapularis, biceps issues may occur and require treatment;

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF INDUSTRIAL ACCIDENTS

Shoulder Injury Treatment Guideline

PAGE THIRTEEN

Surgical Procedures which may be associated/indicated with a Rotator Cuff Repair, CONTINUED:

- Debridement or Extensive Debridement and Release of Adhesions – Some debridement is common and part of rotator cuff surgery. However, extensive debridement and release of adhesions is critical and expected in revision situations;
- Suprascapular Nerve Release - Generally, not necessary. Refer to **Section C.4.f SUPRASCAPULAR NERVE**;
- Coracoidplasty - The only indication for this is for subscapularis tears due to repetitive trauma and even this is rarely indicated.

9. Shoulder Instability/Glenohumeral Instability

Non-operative Treatment Procedures:

In subacute and/or chronic instabilities, age of onset of instability is an important part of the history. Older patients are less likely to have recurrent dislocations unless they have associated large rotator cuff tears. Therefore, the rotator cuff tear protocol should be followed if there is a suspicion of this pathology. Associated axillary nerve injuries are more common in older patients. Patients less than 30 years of age, especially males actively participating in sports, tend to have a higher recurrence rate.

Surgery should be considered for these patients after the first dislocation. In patients under 30, one must consider the possibility of recurrent instability, although there is still a role in almost all circumstances, barring a significant bone injury, that these patients can be treated by 3 weeks of immobilization and then therapeutic rehabilitation. If instability recurs, surgical intervention could be considered. In patients over age 40, the recurrence rate drops and these patients can almost all be treated nonoperatively. In patients over age 40 with a traumatic shoulder dislocation and significant weakness, an MRI should be done to evaluate for possible rotator cuff tear. For these patients, the instability can be treated nonoperatively but if the cuff is torn, they may need surgical repair of the cuff once the capsule heals. Avoid any aggressive treatment in patients with history of voluntary subluxation or dislocation.

- i. First-time dislocation: Immobilization. Consider operative intervention for young patients active in sports, or older patients with significant rotator cuff tears. If the patient is diagnosed with a displaced fracture (i.e., greater tuberosity) or a rotator cuff tear, then operative management is warranted.
- ii. Acute or chronic dislocations: With a fracture contributing to instability, practitioner should immobilize dislocations if in an acceptable position. Consultation should be obtained as operative repair may be necessary. Glenoid fracture may contribute to instability and may indicate need for more urgent surgical repair.
- iii. Subacute and/or chronic instability: Chronic dislocations should first be treated similarly to acute dislocation. If continuing treatment is unsuccessful, with findings of instability, operative repair should be considered. Patients with chronic recurrent dislocations may benefit from a CT scan to evaluate bone loss prior to surgery. Therapeutic rehabilitation interventions: maximum 12 sessions. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF INDUSTRIAL ACCIDENTS

Shoulder Injury Treatment Guideline

PAGE FOURTEEN

9. Shoulder Instability/Glenohumeral Instability, CONTINUED:

Surgical Indications:

Identify causative agent for the instability. Initial operative repair in young active patients should be considered to prevent further subluxations or dislocations which may result in cartilage injury. Fractures not amenable to immobilization may also need operative management after the first dislocation. Older patients with documented large rotator cuff tears should also be considered for operative repair after first time dislocations. Repair of the rotator cuff tear alone or in combination with stabilization should be considered. Refer to the **Section C8. Rotator Cuff Tear**.

In general, older patients without the above lesions will suffer few recurrences, and therefore, are treated conservatively. Operative repair may be considered only after recurrent dislocations when functional deficits interfere with activities of daily living and/or job duties and active patient participation in non-operative therapy has occurred. Patients with multi-directional laxity and/or laxity in the contralateral shoulder should be evaluated thoroughly for underlying collagen disorders, and to have failed a minimum of 12-26 weeks of a well-designed rehabilitation program before being considered for any operative procedures. Avoid any aggressive treatment in patients with history of voluntary subluxation or dislocation.

Indication for Shoulder Dislocation Surgery: See criteria related to first-time dislocation in young patients, or those with displaced fractures, or with rotator cuff tears.

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

10. Superior Labrum Anterior and Posterior (SLAP) Lesions

Superior labral tears are either the result of acute traumatic injury or chronic degenerative pathology. Most labral tears are more prevalent with advancing age, and over age 40 commonly represent a natural degenerative process which does not require surgery. Most SLAP lesions are associated with other pathology such as rotator cuff tears, Bankart lesions, joint instability, biceps tendon tears, and supraspinatus tears.

Types of lesions:

- Type I A fraying of the superior labral edge without detachment of the labrum from the glenoid rim.
- Type II A detachment of the biceps anchor from the glenoid. Three distinct Type II lesions have been described as anterior only, posterior only, or combined anterior and posterior.
- Type III A bucket handle tear in the superior labrum only with biceps tendon and remainder of the superior labrum having stable attachment.
- Type IV A bucket handle tear as in Type III, but with extension of the tear into the biceps tendon. Additional types of lesions have been described that include extensions of the above-described lesions or extensions of Bankart lesions.

Non-operative Treatment Procedures:

For suspected isolated SLAP lesions, benefits may be achieved through therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Subacromial bursal and/or glenohumeral steroid injections may decrease inflammation and allow the progression of treatment. Time to produce effect is one injection. Maximum of 3 injections in one year at least 8 to 12 weeks apart. Benefits of each injection must be documented noting the degree and duration of benefit, and impact on function.

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF INDUSTRIAL ACCIDENTS

Shoulder Injury Treatment Guideline

PAGE FIFTEEN

10. SLAP Lesions, CONTINUED:

Surgical Indications:

Superior labral tears, especially a type 2 peel off, should be treated nonoperatively or at most with a debridement as it is often a degenerative process, especially in anyone over age 40. The few indications for surgical intervention would be a type 2 in younger patients and type 3 or type 4 SLAP injury that involves the biceps or in a young patient under age 30 who has an overhead occupation or was injured in a direct traction injury. In patients over age 30, especially those who have an associated rotator cuff tear, a biceps tenodesis should be considered. Consider operative repair in young workers or workers engaged in overhead work activity with a symptomatic Type II SLAP tear. Other candidates for SLAP repairs include patients with associated labral disruptions (i.e., Bankart lesions). Older patients and/or workers engaged in overhead activities with symptomatic SLAP tears unresponsive to non-operative treatment should be considered for either a biceps tenodesis or tenotomy.

Identify other shoulder pathology and if any exists follow the appropriate operative indications. If a SLAP lesion is suspected, an arthroscopic exam should be performed in conjunction with the primary operative procedure and an appropriate repair performed if necessary. Surgery may be indicated when no additional pathology is identified, and there is an inadequate response to at least three months of non-operative management with active patient participation (as evidenced by continued pain with functional limitations and/or instability significantly affecting activities of daily living or work duties).

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.

D. NON-OPERATIVE TREATMENT PROCEDURES

1. Acupuncture

Must be ordered by a licensed MD, DC, DO, PA, NP, or PT and performed by an acupuncturist licensed in the state where the acupuncture service is provided. Eight (8) visits allowed in first six (6) weeks of acupuncture treatment. Thereafter, the ordering practitioner may request additional visits if there is documentation of objective improvement in functional activity or when the symptomatic benefit facilitates progression in the patient's treatment program. Maximum visits are not to exceed sixteen (16) visits in twelve (12) weeks. The ordering/treating practitioner cannot be the provider of the acupuncture service.

2. Biofeedback

Not recommended as a sole modality.

3. Injections

Injection therapy should not begin before 6 weeks post injury in order to prevent the exclusion of effective conservative treatment. However, if the patient is unable to participate in rehabilitation because of severe pain, injection therapy should be allowed. These injections are seldom meant to be "curative" and when used for therapeutic purposes they are employed in conjunction with other treatment modalities for maximum benefit. Reassessment of the patient's status in terms of functional improvement should be documented after each injection. Patient response must be documented such that the diagnostic value of the procedure is evident to reviewers. At a minimum, the provider should document patient response after the injection.

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF INDUSTRIAL ACCIDENTS

Shoulder Injury Treatment Guideline

PAGE SIXTEEN

3. Injections, CONTINUED:

a. Shoulder Joint Injections: No more than 3 to 4 times annually, at least 8 to 12 weeks apart. Benefits of each injection must be documented noting the degree and duration of benefit, and impact on function, before a subsequent injection is provided. The use of fluoroscopic or ultrasound guidance should be considered to ensure proper needle placement.

b. Subacromial Injections for tendinopathy or bursitis: Blinded subacromial blocks may not be accurate and if there is a concern regarding needle placement, sonography or fluoroscopy may be used.

c. Soft Tissue Injections: Include bursa and tendon insertions. Frequency: Usually 1 or 2 injections are adequate. Maximum 3 steroid injections at the same site per year, at least 8 to 12 weeks apart.

d. Trigger Point Injections: Not routinely used in the shoulder. Generally, these injections are not necessary unless consistently observed trigger points are not responding to specific, noninvasive, myofascial interventions within approximately a 6-week time frame. Frequency: Weekly, no more than 4 injection sites per session per week to avoid significant post-injection soreness. Maximum Duration 8 weeks. Occasional patients may require 2 to 4 repetitions of trigger point injection series over a 1 to 2 year period.

e. AC Joint Injections: No more than 3 to 4 times annually, at least 8 to 12 weeks apart. Fluoroscopic or ultrasound guidance recommended. Benefits of each injection must be documented noting the degree and duration of benefit, and impact on function, before a subsequent injection is provided. Refer to **Section A-Benefit from Injections.**

f. Suprascapular Nerve Block: Maximum of 2 diagnostic injections, at least 2 weeks apart.

If intraarticular shoulder injection for shoulder OA or subacromial space injection for tendinopathy does not provide significant pain relief and patient continues to have shoulder pain that limits shoulder ROM, then a suprascapular nerve block may be done. Must be done with either fluoroscopic or ultrasound guidance, with ultrasound guidance preferred. Following the procedure specifying any reduction or resolution of symptoms must be documented. In general, relief should last for at least the duration of the local anesthetic used and should provide a minimum of 50% pain reduction as measured by a numerical pain index scale.

g. Neuroablation of the Suprascapular nerve with either Cryoablation or Radiofrequency Lesioning: Must be done with ultrasound or fluoroscopic guidance. If the suprascapular nerve blocks provide 50% or more pain reduction as measured by a numerical pain index scale within one hour, then neuroablation of the suprascapular nerve on the affected side may be done. Pain relief must last a minimum of 120 days and result in improved function of the affected shoulder with subsequent physical rehabilitation medicine in order to repeat the treatment.

4. Medications

Pain control is initially accomplished with acetaminophen and/or NSAIDs. Opioids and other agents should only be used for the treatment of severe upper extremity pain. Opioids often provide only limited pain reduction and improvement in function, and increase the risk of dependence and addiction. As such, other non-opioid and/or non-pharmacological options may be superior to opioids. Ongoing effort to gain improvement in activities of daily living, and social and physical function as a result of pain relief should be a primary goal with the use of any medication. Functional improvement must be documented for continued use of opioids. Consultation or referral to a pain specialist should be considered when the pain persists beyond the expected time for tissue healing of the injury. Consider consultation to a pain specialist if suffering and pain behaviors are present and the patient continues to request medication, or when standard treatment measures have not been successful or are not indicated. For on-going/long-term opioid management, refer to MA Chronic Pain Treatment Guideline.

5. Occupational Rehabilitation Programs

Work Conditioning/Simulation: If modified duty is not available, maximum 4 weeks.

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF INDUSTRIAL ACCIDENTS

Shoulder Injury Treatment Guideline

PAGE SEVENTEEN

6. Patient Education

Treatment plans should address patient education to maximize treatment benefits, assist with self-management of symptoms, and prevent future injury. Patients should be encouraged to participate in establishing functional outcome goals.

7. Psychosocial/Psychological Intervention

Treatment should be implemented as soon as the problem is identified. Goal oriented treatment should be cognitive, behavioral or operant approaches provided by licensed mental health providers trained to treat patients with persistent pain. Specific treatments have been shown to be effective in individual or group format. Treatment frequency is 1 to 2 times weekly for the first 8 weeks (excluding hospitalization, if required). Thereafter, 2 to 4 times monthly with the exception of exacerbations which may require increased frequency of visits, not to include visits for medication management. Treatment duration is 2 to 6 months with a maximum of 6 to 12 months, not to include visits for medication management. For select patients, longer supervised treatment may be required and, if further counseling beyond 6 months is indicated, functional progress must be documented. Treatment should be part of an overall interdisciplinary treatment plan, and return to work must be a treatment goal if medically possible. Due to the risk of major depression and anxiety, psychopharmacology consultation should be available.

8. Therapeutic Interventions

- a. **Active Therapy:** Re-evaluation should be performed every four weeks. Progress must be documented for continued therapy. Patients should be instructed to continue active therapies at home.
- b. **Passive Therapy:** To be used adjunctively with active therapy. No more than 2 passive modalities per treatment session.

CPM, Dynamic Splinting, Viscosupplementation not recommended.

E. OTHER OPERATIVE PROCEDURES

1. Arthroscopy

Limited to cases where imaging is inconclusive, and functional limitation with pain continues despite conservative care.

2. Shoulder Replacement (Arthroplasty)

Surgical Indications:

The most common indication for total shoulder arthroplasty is osteoarthritis, avascular necrosis, post traumatic arthritis, inflammatory arthritis with an intact rotator cuff and hemiarthroplasty for acute fracture.

Post-operative Treatment:

Maximum of 24 sessions. If functional gains are being achieved additional visits may be authorized for the patient to achieve the functional goal.

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF INDUSTRIAL ACCIDENTS

Shoulder Injury Treatment Guideline

PAGE EIGHTEEN

3. Reverse Total Shoulder Replacement (Arthroplasty)

Surgical Indications:

1. Irreparable rotator cuff tear with profound weakness with/without arthritis. Profound weakness means either pseudoparalysis with inability to raise the arm above the chest level or marked loss of functional external rotation. Irreparable subscapularis tendon tear with loss of function is also an indication if there is static anterior subluxation of the humeral head and tendon transfer is not likely to be effective.
2. Comminuted proximal humerus fractures which may be acute or malunion or non-union.
3. Failed hemiarthroplasty or total shoulder arthroplasty with irreparable rotator cuff tear.

Outcome Expectations:

Reverse prosthesis is reasonably expected to improve pain and function. It is not reasonable to anticipate return to forceful use of the arm for overhead work or heavy work below the level of the shoulder.

4. Hardware Removal

Surgical Indications:

Persistent local pain; irritation around hardware

Post-operative Treatment:

Therapeutic rehabilitation interventions: maximum 12 sessions with importance placed on the home program. Additional sessions may be warranted if there is documented functional improvement and the patient has not attained the functional goal.