INTERNATIONAL ACADEMY OF ADVANCED CHIROPRACTIC ORTHOPEDICS

presents

DR. MITCH MALLY
International Speaker
10th Degree Black Belt in Extremity Adjusting
www.FromTheDeskOfDrMitchMally.com
mallyenterprises@hotmail.com

SPORTS & OCCUPATIONAL INJURIES OF THE SHOULDER

All rights reserved. These materials may not be reproduced in any form without the written consent of the author. The material was developed from original as well as authentic and highly reputable sources. References to outside sources are listed.

Every effort has been made to provide accurate and reliable information; however, the author cannot assume responsibility for the efficacy of this information and the consequences of its use or application.
The “Magnificent 7” Shoulder

Acute Shoulder Injuries

"...shoulder is the most mobile joint in the human body...increased risk of injury...Clavicle fractures are among the most common acute shoulder injuries, and more than 80 percent of them can be managed conservatively. Humeral head fractures are less common and usually occur in elderly persons; 85 percent of them can be managed nonoperatively...Soft tissue injuries include shoulder dislocations, rotator cuff tears, and acromio-clavicular sprains. Acromio-clavicular injuries...types I and II are treated conservatively, types III and IV are treated surgically...debate about the best approach for type III. Eighty percent of shoulder dislocations are anterior...nonsurgical technique...rotator cuff tears can be managed conservatively or surgically..."
MRI Findings in Throwing Shoulders: Abnormalities in Professional Handball Players

“...shoulders of throwing athletes are highly stressed joints and likely to have more structural abnormalities seen on magnetic resonance imaging scans...an average of seven abnormal magnetic resonance imaging findings was observed in the throwing shoulders...93% of the throwing shoulders had abnormal magnetic resonance imaging findings, only 37% were symptomatic, Partial rotator cuff tears...superolateral osteochondral defects of the humeral head...typical throwing lesions...this suggests that the evaluation of an athlete's throwing shoulder should be done very thoroughly and should not be based mainly on abnormalities seen on magnetic resonance imaging scans...”


Identifying and Managing Shoulder Pain in Competitive Swimmers. How to Minimize Training Flaws and other Risks.

“...shoulder pain resulting from glenohumeral instability is common among competitive swimmers. The biomechanics inherent to swimming promotes muscular imbalances that stresses the capsulo-ligamentous structures and contribute to shoulder instability. Most swimmers respond favorably to conservative treatment of rest and rehabilitation ... swimmers who respond well to rehabilitation have a better prognosis for a successful return to swimming that those who require surgery...”


Upper extremity disorders in the workplace: Costs and outcomes beyond the first return to work

“...Cumulative trauma disorders of the upper extremities (CTD) have become increasingly important in workers' compensation caseloads over the last two decades...analyzed post-injury employment patterns and return-to-work probabilities for a sample of Ontario workers with CTD, for up to five years after injury...workers’ with CTD are compared to results for workers with back injuries or fractures...most workers with CTD return to work at least once...does not necessarily mark the end of work disability...26% with CTD report a second injury-related absence...18% with back pain...12% with fractures...a substantial proportion of workers with CTD or work-related back pain experience injury-related absences after their first return to work...”

ReSEARCH REPORT
Resting Position Variables at the Shoulder:
Evidence to Support
a Posture-Impairment Association

“...posture and impairment are not directly related, but linked by
movement dysfunction...the relationships among posture, pectoralis
minor muscle length, and movement alterations at the
shoulder...scapula orientation, thoracic kyphosis, and pectoralis
minor muscle lengths were measured...significant group differences
were demonstrated for several posture variables...thoracic spine
kyphosis and scapular internal rotation...distance from the sternal
notch to the coracoid process demonstrated the highest correlation
with pectoralis minor muscle length...”

The Effect of Long Versus Short Pectoralis Minor Resting Length on Scapular Kinematics in Healthy Individuals

"...to compare scapular kinematics during arm elevation between groups distinguished by pectoralis minor resting length...individuals with subacromial impingement have altered scapular kinematics...loss of posterior tipping and increased internal rotation...with the scapula for the short group staying anteriorly tipped at higher angles...with individuals with a shorter pectoralis minor demonstrating a more internally rotated scapula...these results support the theory that an adaptively short pectoralis minor may influence scapular kinematics and is therefore a potential mechanism for subacromial impingement..."


Shoulder function and 3-dimensional scapular kinematics in people with and without shoulder impingement syndrome.

"...several factors such as posture, muscle force, range of motion, and scapular dysfunction are commonly believed to contribute to shoulder impingement...impingement group...slightly greater scapular upward rotation and clavicular elevation during flexion and slightly greater scapular posterior tilt and clavicular retraction during scapular-plane elevation...impingement group...less range of motion and force in all directions...no differences in resting posture...the kinematic differences found in subjects with impingement may represent scapulothoracic compensatory strategies for glenohumeral weakness or motion loss. The decreased range of motion and force found in subjects with impingement support rehabilitation approaches that focus on strengthening and restoring flexibility..."


Scapulothoracic and Glenohumeral Kinematics Following an External Rotation Fatigue Protocol

"...to determine the effects of shoulder external rotator muscle fatigue on 3-dimensional scapulothoracic and glenohumeral kinematics. The external rotator muscles of the shoulder are important for normal shoulder function. Impaired performance of these muscles has been observed in subjects with impingement syndrome and it is possible that external rotator muscle fatigue leads to altered kinematics of the shoulder girdle...after completing the fatigue protocol...demonstrated less external rotation of the humerus...less posterior tilt of the scapula in the beginning phase of arm elevation...more scapular upward rotation and clavicular retraction in the mid ranges of arm elevation...performance of an external rotation fatigue protocol results in altered scapulothoracic and glenohumeral kinematics..."

**Pathomechanics in Atraumatic Shoulder Instability: Scapular Positioning Correlates with Humeral Head Centering**

“…analyze three-dimensional scapular positioning and glenohumeral centering of normal atraumatic unstable shoulders. Scapular plane was increased in nine of 14 patients and decreased in three patients. Scapular internal rotation in the transverse plane was increased in all unstable shoulders. Unstable shoulders also had malcentering of the humeral head in the direction of instability during various arm positions… The high correlation suggests that scapular positioning is relevant for humeral head decentering... Physiotherapeutic strategy should consider the malpositioning of the scapula and be adapted to the direction of instability...”


---

**Anatomical and Biomechanical Mechanisms of Subacromial Impingement Syndrome.**

“…subacromial impingement syndrome is the most common disorder of the shoulder, resulting in functional loss and disability... Evidence exists to support the presence of the anatomical factors of inflammation of the tendons and bursa, degeneration of the tendons, weak or dysfunctional rotator cuff musculature, posterior glenohumeral capsule tightness, postural dysfunctions of the spinal column and scapula and bony or soft tissue abnormalities of the borders of the subacromial outlet... Dysfunctional glenohumeral and scapulothoracic movement patterns...”


---

**Has the management of shoulder dislocation changed over time?**

“...Anterior shoulder dislocation... recently the treatment of traumatic shoulder dislocation has included immobilisation for varying periods of time followed by physiotherapy... Most frequent mechanism of injury was a fall (65.66% of cases)... 92.1% of the patients, the shoulder was reduced in the Emergency Department without the need for sedation or general anaesthesia... Overall recurrence rate in all ages was 50%... 8.9% in the 14-20 year age group... Duration of immobilisation did not affect the rate of re-dislocation of the humeral head. Conventional shoulder immobilisation in a sling offers no benefits, and it would be preferable not to immobilize the shoulder at all...”

Current Concepts in the Recognition and Treatment of Superior Labral (SLAP) Lesions

“...Pathology of the superior aspect of the glenoid labrum (SLAP lesion) poses a significant challenge to the rehabilitation specialist due to the complex nature and wide variety of etiological factors associated with these lesions... postoperative rehabilitation... emphasis is placed on protecting the healing labrum, while gradually restoring range of motion, strength, and dynamic stability of the glenohumeral joint...”


A Retrospective, Descriptive Study of Shoulder Outcomes in Outpatient Physical Therapy

“...to describe the clinical and functional outcomes of clients with shoulder dysfunction following outpatient physical therapy and to compare the outcomes by type of shoulder dysfunction... 55.1% had shoulder impingement... 18.3% had postoperative repair, 8.9% had a frozen shoulder, 7.6% had a rotator cuff tear, 3.0% had shoulder instability, 2.1% were post fracture... demonstrated improvement in both clinical and functional measures at the conclusion of physical therapy...”


Management of Shoulder Hemiarthroplasty in a Patient with Rheumatoid Arthritis

“...Rehabilitation after shoulder hemiarthroplasty for rotator cuff tear arthropathy (RCTA) represents a significant challenge... limited goals... no pain or slight pain at rest, moderate pain with vigorous activity... external rotation active range of motion (AROM) greater than 20 degrees and shoulder abduction AROM greater that 90 degrees... following physiotherapy... pain scale at rest was 0/10... vigorous activity 1/10 to 2/10. Shoulder AROM was normal and shoulder rotation and elevation strength was good... despite limited expectations, this patient achieved normal shoulder ROM and near normal shoulder strength after 14 weeks of physical therapy...”

Chapter 1

Shoulder Anatomy

PECTORAL GIRDLE ANTERIOR VIEW

Musculocutaneous Nerve (C5, 6, 7)
(Only muscles innervated by musculocutaneous nerve are depicted)

KINESIOPATHOLOGY

ETIOLOGY
- WEIGHT LIFTERS
- THROWING ATHLETES
- HEAVY LABORERS

NEUROPATHOLOGY

ACUTE PRESENTATION
- INCREASE SENSATION LATERAL ASPECT FOREARM
- INABILITY TO FLEX ELBOW
- INCREASED STRENGTH OF BICEPS AND BRACHIALIS

CHRONIC PRESENTATION
- DECREASE SENSATION LATERAL ASPECT FOREARM
- MOTORIC INABILITY TO FLEX ELBOW
- DENERVATED STRENGTH OF BICEPS AND BRACHIALIS

PECROTAL GIRDLE POSTERIOR VIEW

Acromion
Suprascapular m.
Supraspinatus m.
Infraspinatus m.
Teres minor m.
Teres major m.
Brachial plexus

MYOPATHOLOGY

NEUROPATHOLOGY

ETIOLOGY
- FORCIBLY ABDUCTED & EXTERNALLY ROTATED ARM
- THROWING SPORTS

LATERAL AXillary Hiatus SYNDROME
- LATERAL AXillary Hiatus SYNDROME
- QUADRILATERAL SPACE SYNDROME

DECREASED SENSATION LATERAL ASPECT FOREARM
- MOTORIC INABILITY TO FLEX ELBOW
- DENERVATED STRENGTH OF BICEPS AND BRACHIALIS
KINESIOPATHOLOGY

SHOULDER ARTHROKINEMATICS

FORCE COUPLE
- Acromion
- Clavicle (coll)
- Coracoid process
- Superior angle
- Superior margin
- Notch
- Neck
- Medial angle
- Medial margin
- Subclavicular fossa
- Intaglionic tubercle
- Lateral margin
- Inferior angle

CRITICAL AREA
- 1 CM PROXIMAL TO GREATER TUBEROSITY
- HYPOVASCULARITY SUBJECTIVE FOR TEAR OF SUPRASPINATUS TENDON

STERNOCLAVICULAR JOINT

HISTOPATHOLOGY
- STERNOCLEAVICULAR CAPSULITIS
- CHONDROMALACIA
- CREPITATION
- 1ST RIB SUBLUXATION

SCAPULOTHORACIC ARTICULATION

MYOPATHOLOGY
- STRETCH
- REFLEX
Sample test question:

• Patient sustains an injury to the left shoulder resulting in an inability to abduct and externally rotate the shoulder. Name the nerve(s) and muscles injured and proposed mechanism of injury:

• How does patient present acute and chronic?
Peripheral nerve injuries in athletes: treatment and prevention.

- **ABSTRACT:** Peripheral nerve lesions are uncommon but serious injuries, which may delay or preclude an athlete’s safe return to sports. Early, accurate anatomical diagnosis is essential. Nerve lesions may be due to acute injury (i.e. from a direct blow) or chronic injury secondary to repetitive microtrauma (entrapment). Accurate diagnosis is based upon physical examination and knowledge of the relative anatomy. Palpation, neurological testing and provocative maneuvers are mainstays of physical diagnosis. Diagnostic suspicion can be confirmed by electrophysiological testing, including electromyography and nerve conduction studies. Proper equipment, technique and conditioning are the keys to prevention. Rest, anti-inflammatories, physical therapy and appropriate splinting are the mainstays of treatment.

---

**Entrapment Neuropathies**

Entrapment neuropathies are any condition in which a peripheral nerve is injured, irritated or otherwise compromised, by external pressure created by compression or impingement in its course through a fibrous or osseofibrous tunnel, or at a point that the nerve changes direction through or over a fibrous or muscular band.

---

**Sympathetic Nerve Supply to Upper Extremities**

Lateral Horn T2-T5, 10
↓
Anterior Roots
↓
White Rami
↓
Sympathetic Trunk
Stellate Ganglion ↓ T2, Ganglion
Synapse
↓
Gray Rami
↓
Join Brachial Plexus
Functional anatomy of the shoulder complex.

- **ABSTRACT:** Stability is primarily dependent on capsulo-ligamentous structures and the musculo-tendinous cuff. The major structures providing joint stability. The glenoid fossa is retrotilted with respect to the plane of the scapula in most normal shoulders. Saha suggested that a ventral tilt or anteversion of the glenoid was associated with anterior instability of the joint. Excessive retroversion, however, was reported to be the primary etiology associated with non-traumatic posterior instability in a study by Brewer et al. In normal shoulders, the humeral head remains centered on the glenoid fossa throughout elevation in the scapular plane. The distance between the inferior surface of the acromion and the humeral head, measured radiographically, averages 8-10 mm in normal shoulders.
The role of the scapula.

**ABSTRACT:** The scapular musculature is often neglected in designing a rehabilitation protocol for the shoulder. Weakness of the scapular stabilizers and resultant altered biomechanics could result in 1) Abnormal stresses to the anterior capsular structures of the shoulder, 2) Increased possibility of rotator cuff compression, and 3) Decreased performance. This article presents known facts about the biomechanics of the scapula and surrounding muscles and suggests methods for evaluation of scapular muscle weakness. Exercise techniques to maximally strengthen the scapular musculature are also described. As our ability to document strength of these muscles improves, we will be able to determine the effect of scapular strengthening on improving symptoms related to impingement and instability. Scapular strengthening exercises are usually nonstressful to the rotator cuff and are easily implemented into a rehabilitation program for the shoulder.

---

The role of the scapular stabilization in overhead motion.

**ABSTRACT:** Athletic activity that involves repetitive overhead movement such as throwing, swimming, or weight training places considerable stress on the glenohumeral joint. Therefore strength and conditioning programs for the overhead motion athlete generally emphasize the glenohumeral joint musculature (deltoids, rotator cuff muscles, pectoralis major, latisimus dorsi, teres major, triceps, and biceps brachii). Frequently overlooked in designing the overhead motion athlete’s training program, however, is the conditioning of the scapular stabilizing muscles: the trapezius (upper, middle, lower), levator scapulae, rhomboids (major, minor), serratus anterior, and pectoralis minor. The scapular stabilizers are responsible for providing proper stability and mobility of the scapula against the thorax (scapulo-thoracic joint). Many of the glenohumeral joint muscles attach to the scapula, thus control of the scapula on the thorax is critical in order for the glenohumeral joint musculature to function optimally during overhead movements.

---

The role of the scapular stabilization in overhead motion. (cont.)

**If** the muscles responsible for scapular stabilization are not properly conditioned, weakness and fatigue may occur during activity. This may interfere with optimal shoulder mechanics during overhead activities, in turn increasing the risk of injury or hindering performance. Therefore it is important to address the muscles responsible for scapular stabilization in the strength and conditioning program for an overhead motion athlete. This article discusses the role of the scapular stabilizers on the prevention and treatment of subacromial impingement syndrome, reviews the significance of these muscles on throwing performance, and illustrates exercises for strengthening the muscles responsible for scapular stabilization.
The physical examination of the glenohumeral joint: Emphasis on the stabilizing structures.

• **ABSTRACT:** Thorough descriptions of specific physical examination tests used to determine gleno-humeral instability are lacking in the scientific literature. The purpose of this paper was to discuss the importance of the subjective history and illustrate the physical examination of the gleno-humeral joint. Additionally, the authors will illustrate specific stability assessment tests for the gleno-humeral joint based on current basic science and clinical research. The physical examination of a patient whose history suggests subtle gleno-humeral joint instability may be extremely difficult for the clinician due to the normal amount of capsular laxity commonly present in most individuals. An essential component of the physical examination is a thorough and meticulous subjective history, which includes the mechanisms of injury and/or dysfunction, chief complaint, level of disability, and aggravating movements. The physical examination must include an assessment of motion, static stability testing, muscle testing, and a neurologic assessment. A comprehensive understanding of various stability testing maneuvers is important for the clinician to appreciate. The evaluation techniques discussed in this paper should assist the clinician in determining the passive stability of the gleno-humeral joint.

**Author(s):** Kevin E. Wilk, PT, James R. Andrews, MD, Christopher A. Arrigo, MS, PT, ATC.

---

**Chapter 2**

**Biomechanics**

---

**Force Couple**

• **A force couple is the action of two forces acting in opposite directions to impose rotation about the axis.**
**Force Couple**

- This coupling effect was confirmed by Mosely et.al. who performed electromyographic analyses during several scapular exercises. The *force couple provides an extremely important function with upward rotation of the acromion away from the humerus in forward elevation of the shoulder, thereby preventing impingement.*

**Evaluation of Scapular Stability**

- Kibler has described the lateral scapular slide measurement, which measures the ability of the scapular stabilizers to control the medial border of the scapula. An increase of *one centimeter or more in side-to-side measurements* was reported to correlate directly with symptoms of pain and decreased shoulder function.

Chapter 3

*Differential Diagnosis*
Supraspinatus Tendon Tears

- **Occur 1cm proximal to its insertion on the greater tuberosity of the humerus.**
- This region is called the **“critical area” because of its relative hypovascularity** compared with the rest of the tendon.

Rotator Cuff Surgery

*Video Presentation*
Wrap Up

- Become the Leading Extremity Expert in your Community
- Learn Dr. Mally’s “Sniper Specific” Techniques of Extremity Adjusting
- Learn how to help patients and exponentially increase your business at the same time

The “Magnificent 7” featuring Dr. Mitch Mally
mrmally@live.com
www.FromTheDeskOfDrMitchMally.com
or find me as Mitch Mally on Facebook

For more information on
Dr. Mally’s seminars (group, Association and private 1-on-1 seminars) and products:
Please email “PJ” Executive Director of Mally Enterprises at
pamela_cook@hotmail.com
or email Dr. Mally at
mrmally@live.com