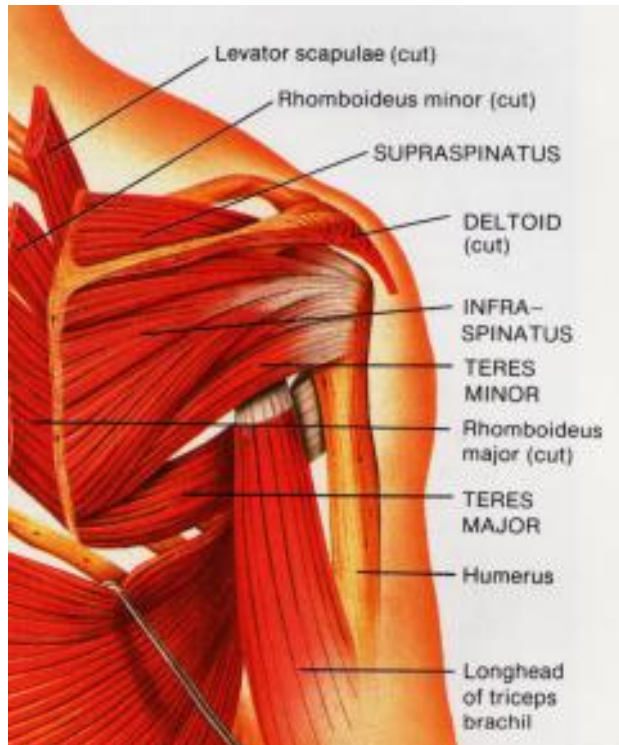


# Strength Prehabilitation for the

## Shoulder Complex

*A Performance Coach's Handbook*



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## 1.0 Introduction

The shoulder joint is the most versatile joint in the body, but it is also the most unstable. Due to its ability to move in multiple planes, the shoulder tends to endure acute trauma, particularly when considering overhead athletes. As sport performance professionals, it is imperative that we realize injuries can occur, regardless of our commitment to ensure proper technique and protection for every athlete. Because injury is probable in athletics, a plan is strongly recommended to be in place both for preventing injury from happening in the weight room and for dealing with injuries that have already occurred. Consider the following list of common shoulder injuries that tend to have a sport related onset:

### Common Athletic Related Shoulder Issues

- Impingement
- Rotator Cuff Tears
- Rotator Cuff Strains
- Shoulder Labral Tear
- Shoulder Separation
- Shoulder Dislocation

This manual has been developed to give performance coaches several exercise prescriptions to utilize either as rehabilitation or prehabilitation. In other words, an array of athletes can benefit from the programs implemented in this manual; athletes who have been diagnosed with an injury or athletes who participate in a sport that takes the shoulder complex through a tremendous amount of wear and tear. In any case, this manual will provide a general understanding both of the basic anatomy of the shoulder and movements associated with the shoulder complex. The exercise regimens included in this manual are basic actions that are applicable most sports. The authors hope this manual will give both sport performance coaches and athletes the opportunity to strengthen the most diverse joint of the human body.

## 2.0 Rehabilitation versus *Prehabilitation*

In the athletic training setting, the term “rehabilitation” is usually a process of helping an athlete recover from a diagnosed injury. If the diagnosis reveals that rehabilitation is necessary to treat the injury, it is up to the athlete, athletic trainer, team physician, and performance coach to come up with a plan to help ensure the athlete regains full function of the injured area of the body.

In the strength and conditioning setting, performance coaches tend to uphold the following two principles when considering athletic injury:

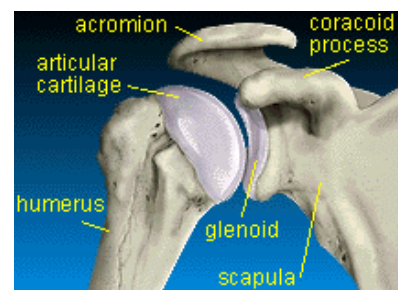
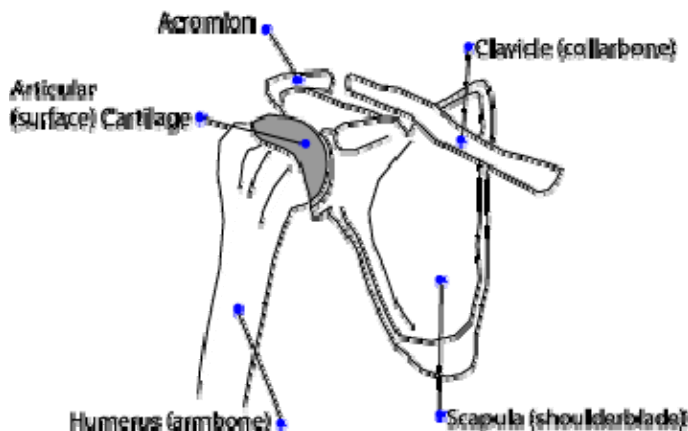
1. Include prehabilitation exercises as a key ingredient to the strength and conditioning program for uninjured athletes, and/or
2. Produce an exercise regimen for an injured athlete that compliments what the athletic trainer prescribes and also allows the injured athlete to return to action sooner than expected.

A key component of any performance driven program should be prehabilitation. This term was coined in an attempt to define an athlete's possible limitations due to competing in a particular sport. For example, baseball, volleyball, and football players tend to have issues with their shoulders due to repetitive overhead stresses placed on the shoulder. When attempting to strengthen these areas most vulnerable to injury, prehabilitation exercises are commonly drawn from rehabilitation programs, but implemented before injury occurs. Typically, the purpose of prehabilitation is to reduce the chance of future injury for that particular athlete. While the idea of prehabilitation is not full proof, it has shown to make a difference in athletic performance. Sports Medicine and Sports Performance personnel working together closely to evaluate an athlete's weaknesses will continue to effectively help these individuals stay off the "chopping block" (surgery) and stay in the game.

### 3.0 Basic Anatomy and Movement of the Shoulder

#### 3.1 Basic Anatomy

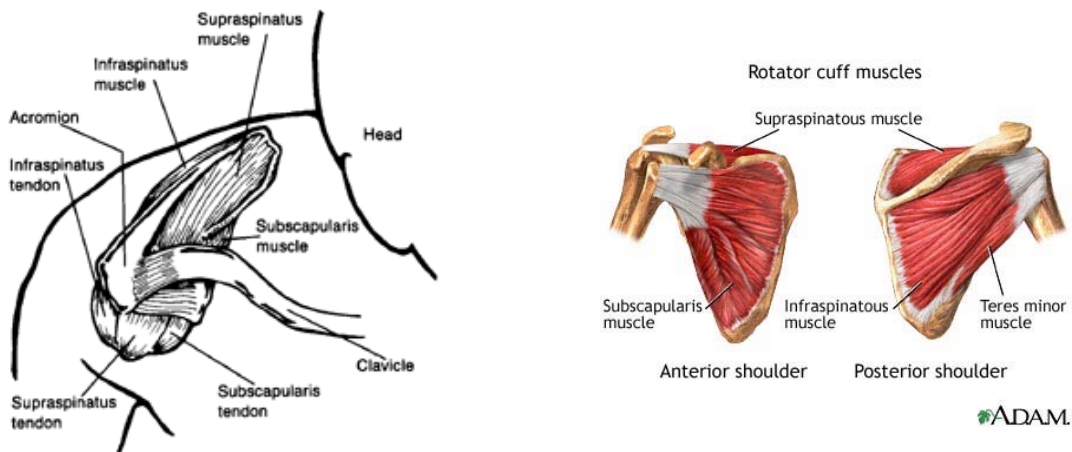
The shoulder joint is primarily made up of 3 bones of the human body. The three bones are the scapula (shoulder blade), the humerus (upper arm), and the clavicle (collar bone), all of which include adjoining muscles that help make up the shoulder complex.



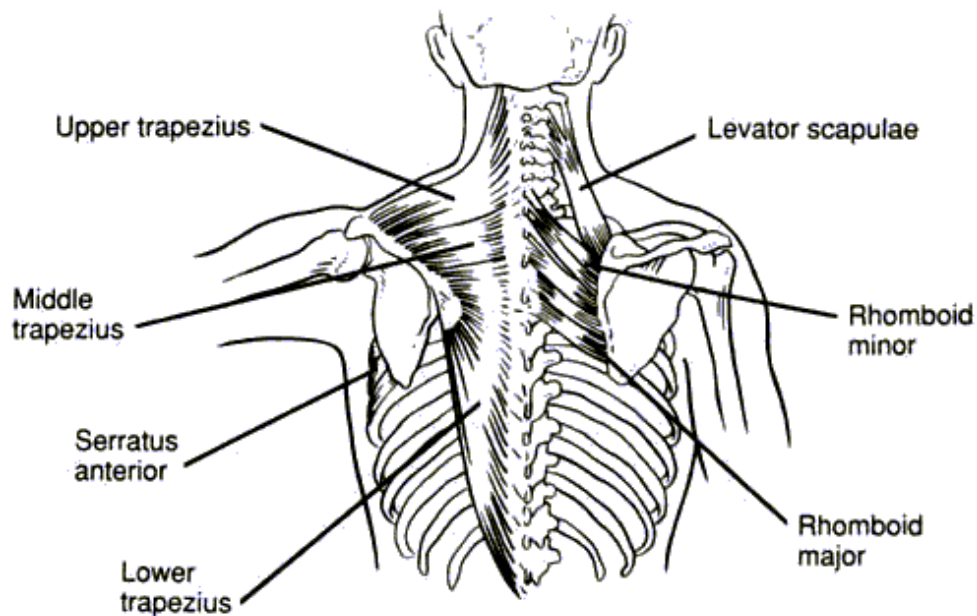
The shoulder joint is generally termed a ball and socket joint, where the head of the humerus (the ball) sits in the glenoid (socket). This is similar to a golf ball sitting on a tee. The ball and socket joint are the most mobile joints of the body.



The muscles of the shoulder can be divided into two groupings. The first group of muscles helps move the arm in relation to the scapula; this group being called the rotator cuff muscles. The rotator cuff muscles include the supraspinatus, infraspinatus, subscapularis, and teres minor.

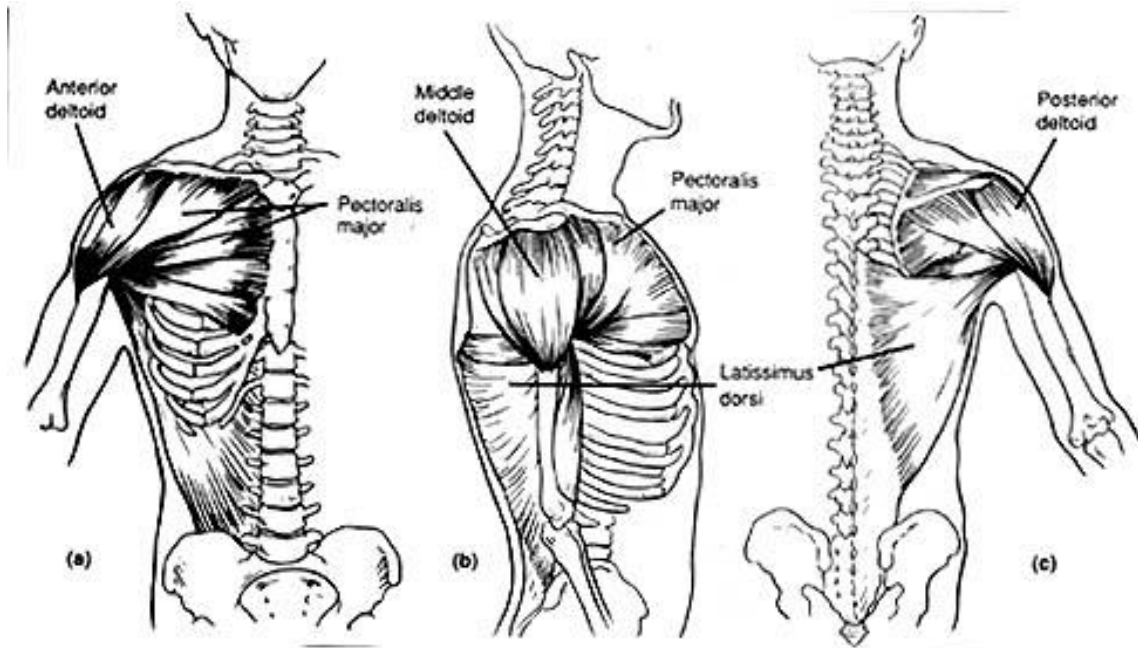


The second group positions the scapula on the rib cage. These muscles include the rhomboids (major and minor), trapezius, and latissimus dorsi. The aforementioned muscles along with the Levator Scapulae are the muscles that connect the arm to the spine.



The pectoralis major and minor, serratus anterior and subclavius are the 4 muscles that connect the arm to the thorax.

Finally we have the deltoid muscle, which is usually broken down into 3 heads, lateral, anterior, and posterior deltoids.



## 3.2 Movements and Muscles

### 3.2.1 Basic Movements of the Shoulder Complex

- Movements at the Scapula
  - Elevation – raising the scapula toward the head, this would be a shrugging movement, moving the scapula up, superior movement
  - Depression – lowering the scapula, moving the scapula down, inferior movement
  - Protraction – moving the scapula forward – rounding the back or pulling the shoulder blades forward to the mid line of the chest, forward movement away from the midline of the body (pushing), moving scapula away from the spine
  - Retraction – moving the scapular backward – straightening the shoulders, backward movement toward the midline of the body (pulling), moving the scapula toward the spine
- Movements at the Arm
  - Flexion – forward movement of the arm
  - Extension – backward movement of the arm
  - Abduction – raising the arm laterally away from the body

- Adduction – lowering the arm toward the side of the body – opposite of abduction
- Circumduction – movement of the arm that includes all four movements (flexion, extension, abduction, adduction) in a circular motion either clockwise or counterclockwise
- Internal Rotation – generally the arm is at a 90-degree angle and the lower part of the arm the ulna and radius rotates into the mid line of the body of the body.
- External Rotation – opposite of internal rotation. The lower arm rotates out and away from the mid line of the body
- Transverse Movement – horizontal movement forward or away from the midline of the body

### 3.2.2 Muscles and Movements

- *Deltoid*
  - 3 Heads of Deltoid
    - Anterior Deltoid
      - Movement – abduction, flexion, internal rotation, transverse flexion
    - Lateral Deltoid
      - Movement – abduction, flexion, transverse abduction
    - Posterior Deltoid
      - Movement – extension, transverse extension, transverse abduction, external rotation
- *Rotator Cuff Muscles*
  - Supraspinatus
    - Movement - abduction and depression, external rotation, stabilization
  - Infraspinatus
    - Movement - external rotation, horizontal extension, transverse abduction, transverse extension, posterior stability
  - Teres Minor
    - Movement – transverse adduction, external rotation and transverse extension, posterior stability
  - Subscapularis
    - Movement - internal rotation, adduction, flexion, anterior and posterior stability
- *Muscles Connecting the Arm to the Spine*
  - Teres Major
    - Movement – adduction, internal rotation, extension
  - Latissimus Dorsi
    - Shoulder Movement – adductions, extension, internal rotation, transverse extension

- Scapula Movement (assists) – depression, downward rotation, adduction
  - Levator Scapulae
    - Movement – scapula elevation, abduction, downward rotation
  - Rhomboid Major
    - Movement – adduction, retraction, downward rotation of the scapula
  - Rhomboid Minor
    - Movement – adduction, retraction, downward rotation of the scapula
  - Trapezius
    - Upper Fibers
      - Movement – elevation
    - Middle Fibers
      - Movement – adduction, elevation, upward rotation
    - Lower Fibers
      - Movement – upper rotation, adduction, depression
- *Muscles Connecting Arm to Thorax*
  - Pectoralis Major
    - Shoulder Movement – adduction, extension, internal rotation, transverse flexion, transverse adduction
    - Scapula Movement (assists) – downward rotation, depression, abduction [initial]
  - Pectoralis Minor
    - Movement – depression downward rotation of the scapula, adduction, protraction
  - Serratus Anterior
    - Movement – adduction, elevation, protraction
  - Subclavius
    - Movement – draws clavicle down and forward

### 3.2.3 Movements and Corresponding Muscles

- *External Rotation*
  - Infraspinatus
  - Supraspinatus
  - Teres Minor
- *Internal Rotation*
  - Latissimus Dorsi
  - Pectoralis Major
  - Subscapularis
  - Teres Major



- *Flexion*
  - Deltoid (anterior and lateral head)
  - Pectoralis Major (clavicular head)
  - Subscapularis
  - Teres Major
  - Biceps Brachii
  - Coracobrachialis
  
- *Extension*
  - Latissimus Dorsi
  - Pectoralis Major (sternal head)
  - Deltoid (posterior head)
  - Teres Major
  - Triceps Brachii (long head)
  
- *Abduction*
  - Deltoid (lateral and anterior heads)
  - Supraspinatus
  - Pectoralis Major (clavicular head)
  
- *Adduction*
  - Latissimus Dorsi
  - Pectoralis Major (sternal and clavicular heads)
  - Subscapularis
  - Teres Major
  - Teres Minor
  - Coracobrachialis
  - Triceps Brachii
  
- *Transverse Adduction*
  - Pectoralis Major (sternal and clavicular head)
  - Coracobrachialis
  
- *Transverse Abduction*
  - Deltoid (posterior and lateral heads)
  - Infraspinatus
  - Teres Minor
  
- *Transverse Extension*
  - Deltoid (posterior)
  - Latissimus Dorsi
  - Infraspinatus

- *Transverse Flexion*
  - Pectoralis Major (sternal and clavicular head)
  - Coracobrachialis
  - Deltoid (anterior head)
  - Biceps Brachii (short head)
  - Teres Minor
  
- *Protraction*
  - Serratus Anterior
  - Pectoralis minor
  - Levator Scapulae
  - Pectoralis Major (sternal head)
  
- *Retraction*
  - Trapezius (middle and lower fibers)
  - Rhomboids (major and minor)
  - Latissimus Dorsi
  
- *Depression*
  - Pectoralis Minor
  - Latissimus Dorsi
  - Pectoralis Major
  - Trapezius (lower fibers)
  
- *Elevation*
  - Trapezius (upper and middle fibers)
  - Levator Scapulae
  - Serratus Anterior
  
- *Scapula Movers*
  - Pectoralis Major - protraction
  - Pectoralis Minor - protraction
  - Serratus Anterior - protraction
  - Trapezius - retraction
  - Rhomboid Major and Minor - retraction

## 4.0 Prehabilitation Prescription #1

General Athletic Population – Holistic Program

### Movement #1 – Lying External Rotation

Note – goal is to keep elbow at a 90° elbow angle at all times (this will be based on individual's specific shoulder flexibility)

Focus Movement – External Rotation

Focus Muscles – Infraspinatus, Supraspinatus, Teres Minor

Description – athlete lies on a bench sideways with his involved limb away from the bench. The athlete locks his arm in a 90° angle and places a towel between his upper body and arm. This allows the shoulder to be in an open packed position. The athlete starts with resistance in his hand and his lower arm across his chest. The athlete then externally rotates the arm until he reaches the end point of his flexibility scale. The athlete returns to starting position.



Prescription

2 sets of 25 repetitions

Tempo 1-2-1-2 (start pause, concentric action, mid point pause, eccentric action)

### Movement #2 – Lying Internal Rotation

Note – goal is to keep elbow at a 90° elbow angle at all times (this will be based on individual's specific shoulder flexibility)

Focus Movement – Internal Rotation

Focus Muscles – Subscapularis

Description – athlete lies on a bench sideways with his involved limb in contact with the bench. The athlete locks his arm in a 90° angle and places a towel between his upper body and arm. This allows the shoulder to be in an open packed position. The athlete starts with resistance in his hand and his lower arm

out away from his body. The athlete then internally rotates the arm until he reaches the chest. The athlete returns to starting position.



#### Prescription

2 sets of 25 repetitions

Tempo 1-2-1-2 (start pause, concentric action, mid point pause, eccentric action)

#### Movement #3 – Close Grip Cable Pulldown to Chest

Note – use “V” bar



Set upper body at 45° angle

Focus Movement – Shoulder Extension, Elbow Flexion, Scapula Retraction, Depression

Focus Muscles – Low Trap, Latissimus Dorsi

Description – athlete positions upper body at a 45° angle. The athlete grips the “V” bar with their arms fully extended and begins the concentric action by pulling/lowering the bar to the base of the chest at a two count pace. The athlete will then pause at the mid point for a one second count before returning the bar to the starting position at a two count pace. The athlete will pause at the starting position for one second before initiating their next repetition.



### Prescription

2 sets of 25 repetitions

Tempo 1-2-1-2 (start pause, concentric action, mid point pause, eccentric action)

### Movement #4 Dumbbell Front Raise

Note – neutral grip – palms facing each other, thumbs up

Focus Movement – Shoulder Flexion

Focus Muscles – Deltoid (lateral and anterior head), Subscapularis

Description - standing, the athlete will hold dumbbells at their side with a neutral grip (palms facing each other, thumbs up). Keeping the arms straight the athlete will begin the concentric action by raising the dumbbells at a two count pace up to shoulder height, pausing for one second at the top before returning to the starting position at a two count pace. The athlete will then pause for one second at the starting position before initiating the next repetition.



### Prescription

2 sets of 25 repetitions

Tempo 1-2-1-2 (start pause, concentric action, mid point pause, eccentric action)

### Movement #5 Dumbbell 45° Front Raise

Note – neutral grip – palms facing each other, thumbs up

Focus Movement – Shoulder Scaption

Focus Muscles – Scapula Stabilizers, Supraspinatus

Description – standing, the athlete will hold dumbbells at their side with a neutral grip position (palms facing each other, thumbs up). Keeping the arms positioned at a 45° angle relative to the body the athlete will begin the concentric action by raising the dumbbells at a two count pace up to shoulder height, pausing for one

second at the top before returning to the starting position at a two count pace. The athlete will then pause for one second at the starting position before initiating the next repetition.



#### Prescription

2 sets of 25 repetitions

Tempo 1-2-1-2 (start pause, concentric action, mid point pause, eccentric action)

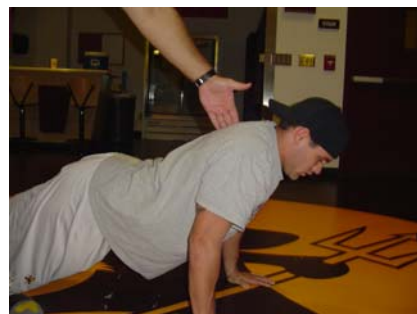
#### Movement #6 Scapula Push Up

Note – elbows remain fully extended if possible

Focus Movement – Protraction

Focus Muscles – Serratus Anterior

Description – starting in the extended pushup position with their scapula fully protracted the athlete will lower their body at a two second pace by retracting their scapula until the shoulder blades have been fully squeezed together. The athlete will then pause for one second before initiating the concentric phase by protracting their scapula and raising their body at a two second pace back to the starting position. The athlete will pause for one second in this position before initiating their next repetition.



## Prescription

2 sets of 25 repetitions

Tempo 1-2-1-2 (start pause, concentric action, mid point pause, eccentric action)

## Movement #7 Scapula Dips

Note – elbows remain fully extended if possible

Focus Movement – depression

Focus Muscles – Latissimus Dorsi, Trapezius (low fibers)

Description – starting in a dip rack with their arms extended and their scapula fully depressed the athlete will lower their body at a two second pace by elevating their scapula until they have reached their full range of motion. The athlete will then pause for one second before initiating the concentric phase by depressing their scapula and raising their body at a two second pace back to the starting position where they will pause for one second before initiating their next repetition.



## Prescription

2 sets of 25 repetitions

Tempo 1-2-1-2 (start pause, concentric action, mid point pause, eccentric action)

## 5.0 Prehabilitation Prescription #2 Stabilization

### Movement #1 Stability Ball Push Up

Note – support ball on wall

Focus Movement – Protraction

Focus Muscles – Pectoralis Major, Serratus Anterior

Description – athlete places their hands on the top of a stability ball which is supported against a wall. The athlete will begin the eccentric action by lowering themselves with their elbows tucked at a two second pace until they reach a point of 90° elbow flexion. Without pausing, the athlete will begin the concentric action by pushing themselves up to the starting position at a two second pace.



Prescription

2 sets of 10 repetitions

Tempo 0-2-0-2 (start pause, concentric action, mid point pause, eccentric action)

### Movement #2 Floor Waxing

Note – utilize towel and smooth surface flooring. Elbows remain fully extended if possible

Focus Movement – Flexion, Extension, Adduction, Abduction, Circumduction

Focus Muscles – Scapula Stabilizers

Description – starting in an extended pushup position with their hand on a towel the athlete will slide their hand across the floor in the prescribed pattern. Maintaining proper posture and stabilization must be a priority. When performing the Front and Back pattern the involved arm will slide across the floor in an up



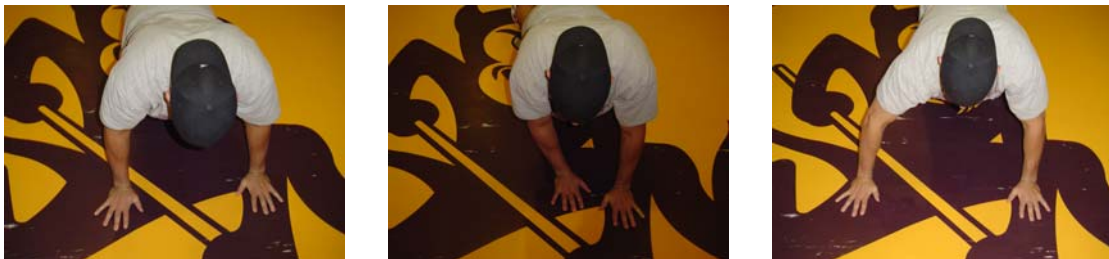


and down motion while the uninvolved arm will remain stationary. In the Side to Side pattern the athlete will slide their involved arm towards the midline of their body then out away from the midline of their body while the uninvolved arm will remain stationary. When performing the Clockwise and Counterclockwise pattern the athlete will slide their involved arm in a circular motion. In all movements an effort must be made to keep weight distributed equally between both limbs.

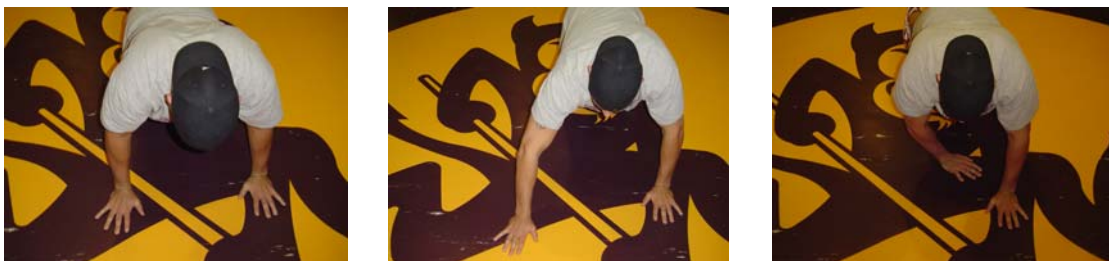
#### Front and Back



#### Side to Side



#### Clockwise and Counterclockwise



Working each movement for time start with 10 seconds each movement, rotating arms. Work up to 60 seconds per movement.

#### Movement #3 Step Over

Focus Movement – Scapula Stabilizers

Focus Muscles – Abduction, Adduction

Description – Lateral Movement: starting in an extended pushup position at the side of 5" box, the athlete will lift the nearest hand to the box up and on to the

box so that one hand is on the box and one hand is on the floor. The athlete will then left their other hand up and on to the box so that both hands are now on the box. The athlete will then complete this lateral movement by moving the first hand to the floor on the opposite side of the box followed by the second hand finishing with both hands on the floor of the opposite side of the box where the exercise initiated. The athlete will continue to move back and forth over the box for the prescribed amount of time. Maintaining proper posture and stabilization during this exercise must be a priority.

Crossover Movement: starting in an extended pushup position at the side of 5" box, the athlete will lift the hand which is farthest away from the box up and on to the box so that one hand is on the box and one hand is on the floor. At this point of the movement the hands should be crossed. The athlete will then left their other hand up and on to the box so that both hands are now on the box. The athlete will then move the first hand to the floor on the opposite side of the box leaving the hands crossed again. The athlete will complete the movement by moving the second hand to the floor so that now both hands are on the floor of the opposite side of the box where the exercise initiated. The athlete will continue to crossover back and forth over the box for the prescribed amount of time. Maintaining proper posture and stabilization during this exercise must be a priority.

#### Lateral Movement



#### Crossover Movement



## Prescription

2 sets of 30 seconds each. Working up to 60 seconds each.

### Movement #4 Six Pack

Note – focus on a strong isometric contraction in shoulder retraction

Focus Movement – Flexion, Extension, External Rotation, Abduction

Focus Muscles – Scapula Stabilizers

Description – For the following movements the athlete will lie face down on a bench. Each movement will be held in an isometric fashion for duration of 15 seconds.

“T” Palms Down – athlete will lie with their arms straight and abducted to a 90° angle relative to the body with their palms facing the floor. The athlete will then raise the arms parallel to the floor.

“T” Thumbs Up [ext rot] – this movement will be performed similar to the “T” Palms Down position with the primary difference being that the athlete will now externally rotate their shoulders aiming their thumbs towards the ceiling. The movement will now be performed in the same manner.

“Y” Palms Down – keeping their arms straight the athlete will now abduct their arms to a 135° angle relative to their body with palms facing the floor.

“Y” Thumbs Up [ext rot] – similar to the “Y” Palms Down position with the primary difference being that the athlete will now externally rotate their shoulders aiming their thumbs towards the ceiling. The movement will now be performed in the same manner.

“W” Thumbs Up - athlete will lie in the “T” Thumbs Up position then flex their elbows to 90° while maintaining the thumbs up position.

“A” Palms Up - athlete will lie with their arms straight and abducted to a 45° angle relative to the body with their palms facing the ceiling. The athlete will then raise the arms parallel to the floor.

“T” Palms Down



“T” Thumbs Up [ext rot]



“Y” Palms Down



"Y" Thumbs Up [ext rot]



"W" Thumbs Up



"A" Palms Up



### Prescription

1 set of each exercise in succession for 10-15 seconds each. Start with no resistance. Max resistance for this exercise should not exceed 10-pound dumbbells

## 6.0 Prehabilitation Prescription #3

### The Throwing/Overhead Athlete

This program will include the first three exercises of Prescription #1. Also, only the involved limb will utilize this program. For example, if your athlete were right handed this prescription would be done with the right arm. Athletes who would implement this program are; pitchers, baseball and softball fielders, tennis players, volleyball players, javelin throwers, and water polo athletes.

#### Movement #4 65-degree Internal/External Rotation

Focus Movement – Internal Rotation, External Rotation

Focus Muscles – Infraspinatus, Supraspinatus, Teres Minor, Subscapularis

Description – standing, the athlete will hold a dumbbell with a pronated grip (palm facing back). With their elbow flexed to 90°, the athlete will abduct their upper arm until it is at a 60° angle to the floor. The athlete will rotate their arm at a two second pace until their hand is directly below their elbow (or until full ROM has been achieved) after a one second pause the athlete will rotate their arm at a two second pace until the hand is directly above their elbow (or until full ROM has been achieved) after a one second pause the athlete will return to the bottom position.



Prescription

2 sets of 25 repetitions

Tempo 1-2-1-2 (start pause, concentric action, mid point pause, eccentric action)

#### Movement #5 Single Arm Dumbbell Extension

Note – keep the elbow high, all movement should occur at the elbow with minimal movement from the shoulder joint

Focus Movement – Elbow Extension

Focus Muscles – Triceps

Description – athlete lies on a bench holding a dumbbell in one hand while crossing the uninjured limb across his chest. The athlete will flex his elbow so that his upper arm is perpendicular to the ground and the dumbbell is positioned next to the athletes head. The athlete will begin the concentric action by extending his arm at a two second pace, focusing on keeping the elbow high and minimizing any movement from the shoulder joint. Once the arm is fully extended, the athlete will pause for a one second count before lowering the dumbbell back to the starting position at a two second pace. The athlete will hold the starting position for one second before initiating their next repetition.



#### Prescription

2 sets of 25 repetitions

Tempo 1-2-1-2 (start pause, concentric action, mid point pause, eccentric action)

#### Movement #6 Supinated Dumbbell Curl

Note– all movement should occur at the elbow with minimal movement from the shoulder joint

Focus Movement – Elbow Flexion

Focus Muscles – Biceps

Description – standing, the athlete will hold a dumbbell at their side with a supinated grip (palm facing forward). The athlete will begin the concentric action by flexing at the elbow, attempting to minimize any movement at the shoulder joint, for a two second pace until full flexion of the elbow has been reached. Without pausing, the athlete will lower the weight to the starting position at a pace of two seconds until the elbow is full extended.



Prescription

2 sets of 10 repetitions

Tempo 0-2-0-2 (start pause, concentric action, mid point pause, eccentric action)

### Movement #7 Dumbbell Single Arm Row supported

Focus Movement – retraction

Focus Muscles – Latissimus Dorsi

Description – athlete will position himself on a bench so that the hand of the uninvolved arm and knee are supported on the bench with the back as flat as possible. The athlete will hold a dumbbell with the involved arm allowing the arm to hang in an extended position to the floor. The athlete will begin the concentric action by pulling the dumbbell in a relatively straight line to the torso at a two count pace. The athlete will pause at the mid point for one second before returning the dumbbell to the starting position at a two count pace. The athlete will pause at the starting position for one second before initiating the next repetition.



Prescription

2 sets of 25 repetitions

Tempo 1-2-1-2 (start pause, concentric action, mid point pause, eccentric action)

## 7.0 Prehabilitation Prescription #4 Posterior Deltoid/Trapezius

### Movement #1 45-degree Dumbbell "Y" Raise

Note – lock upper body at 45-degrees, neutral grip, palms facing each other thumbs up. Palms down take out majority of Supraspinatus involvement.

Focus Movement – Shoulder Scaption

Focus Muscles – Deltoid (lateral and medial head), Supraspinatus, Upper Trapezius

Description – standing, the athlete will hold dumbbells at their side with a neutral grip (palms facing each other, thumbs up). The athlete will now flex at the hips to bring their torso to a 45° angle, allowing the dumbbells to hang towards the floor. Keeping the arms straight the athlete will then raise the dumbbells forward at a two count pace up to shoulder height at a position 135° relative to the body, pausing for one count at the top before returning to the starting position at a two count pace. The athlete will then pause for one count at the starting position before initiating the next repetition.



### Prescription

2 sets of 25 repetitions for endurance

2 sets of 10 repetitions for strength

Tempo 1-2-1--2 (start pause, concentric action, mid point pause, eccentric action)

### Movement #2 45-degree Dumbbell "T" Raise

Note – Supinated hand positions palms facing away.

Focus Movement – Abduction (horizontal)



## Focus Muscles – Deltoid (posterior head), Mid Trap, and Infraspinatus

Description – standing, the athlete will hold dumbbells at their side with a supinated grip (palms facing up). The athlete will now flex at the hips to bring their torso to a 45° angle, allowing the dumbbells to hang towards the floor. Keeping their arms straight the athlete will then raise the dumbbells out to their sides at a two count pace up to shoulder height at a position 90° relative to the body the thumbs remaining aimed towards the ceiling. The athlete will pause for one count at the top before returning to the starting position at a two count pace. The athlete will then pause for one count at the starting position before initiating the next repetition.



### Prescription

2 sets of 25 repetitions for endurance

2 sets of 10 repetitions for strength

Tempo 1-2-1--2 (start pause, concentric action, mid point pause, eccentric action)

### Movement #3 45-degree Dumbbell "A" Raise

Note – pronated hand position, palms facing up and mid point of movement

Focus Movement – Shoulder Extension

Focus Muscles – Deltoid (posterior) Mid Trap

Description – standing, the athlete will hold dumbbells at their side with a pronated grip (palms facing back). The athlete will now flex at the hips to bring their torso to a 45° angle, allowing the dumbbells to hang towards the floor. Keeping their arms straight the athlete will then raise the dumbbells back to their sides at a two count pace up to hip height at a position 45° relative to the body with the palms facing towards the ceiling. The athlete will pause for one count at the top before returning to the starting position at a two count pace. The athlete

will then pause for one count at the starting position before initiating the next repetition.



#### Prescription

2 sets of 25 repetitions for endurance

2 sets of 10 repetitions for strength

Tempo 1-2-1--2 (start pause, concentric action, mid point pause, eccentric action)

#### Movement #4 60-degree Dumbbell "Y" Raise

Note – Lower back angle for 45-degree – hand position same as 45-degree movement

Focus Movement – Shoulder Scaption

Focus Muscles – Deltoid (lateral and medial head), Trapezius (all fibers)

Description – standing, the athlete will hold dumbbells at their side with a neutral grip (palms facing each other, thumbs up). The athlete will now flex at the hips to bring their torso to a 60° angle, allowing the dumbbells to hang towards the floor. Keeping the arms straight the athlete will then raise the dumbbells forwards at a two count pace up to shoulder height at a position 135° relative to the body, pausing for one count at the top before returning to the starting position at a two count pace. The athlete will then pause for one count at the starting position before initiating the next repetition.

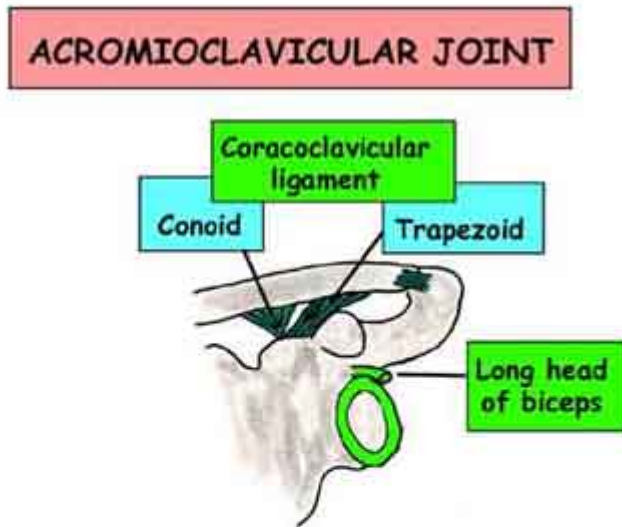


Prescription

2 sets of 10 repetitions

Tempo 0-2-0-2 (start pause, concentric action, mid point pause, eccentric action)

## Appendix A Acromioclavicular Joint



Synovial  
Atypical  
Thick superior capsule (acromioclavicular ligament)  
Incomplete fibrocartilaginous disc in upper joint  
Strong coracoclavicular ligament  
Nerve: Lateral supraclavicular (C4)  
Movements: gliding (passive) and 20° of rotation of scapula

## Appendix B Glenohumeral Joint

### SHOULDER JOINT (GLENOHUMERAL)

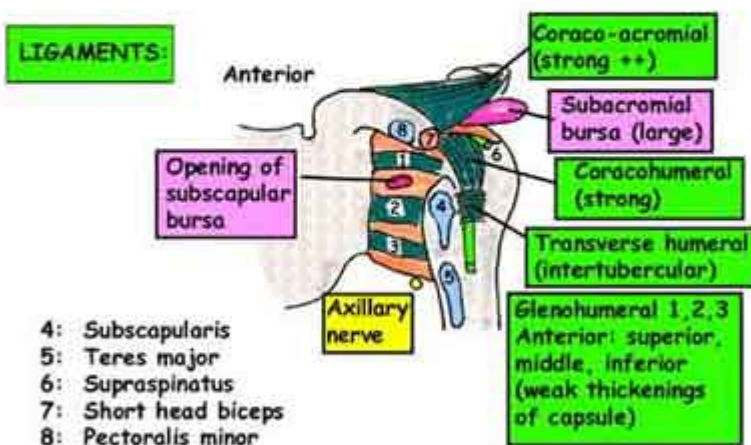
Shallow glenoid fossa - deepened by glenoid labrum

Synovial, Ball and socket

Humeral head is 1/3 hemisphere

**Capsule:** Strong & taut superiorly (anti-sag), inferiorly lax and inserted lower to allow wide abduction, flexion and extension

**Synovium:** Envelops biceps tendon, communicates with bursae anteriorly and posteriorly



**Blood:** circumflex humerals

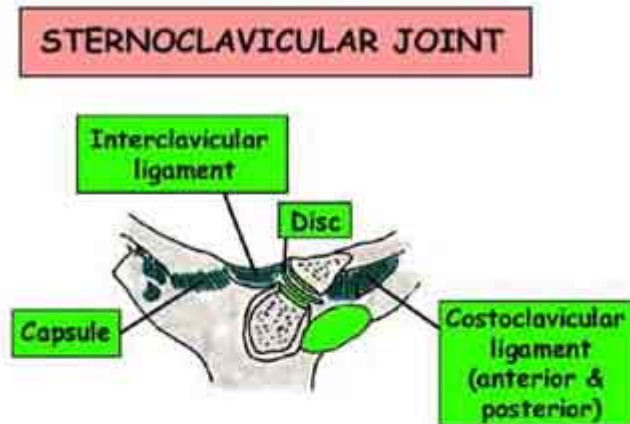
**Nerves:** Subscapular, suprascapular, axillary (Hilton's law)

**Bursae:** Subscapular, subacromial, infraspinatus, supraspinatus

**Stability:** Bones (poor), Capsule (relatively poor), Muscles +++ ligaments +++

**Support:** Rotator cuff (subscapularis, supraspinatus, infraspinatus, teres minor), long head biceps, triceps in abduction, muscles from chest to arm

## Appendix C Sternoclavicular Joint



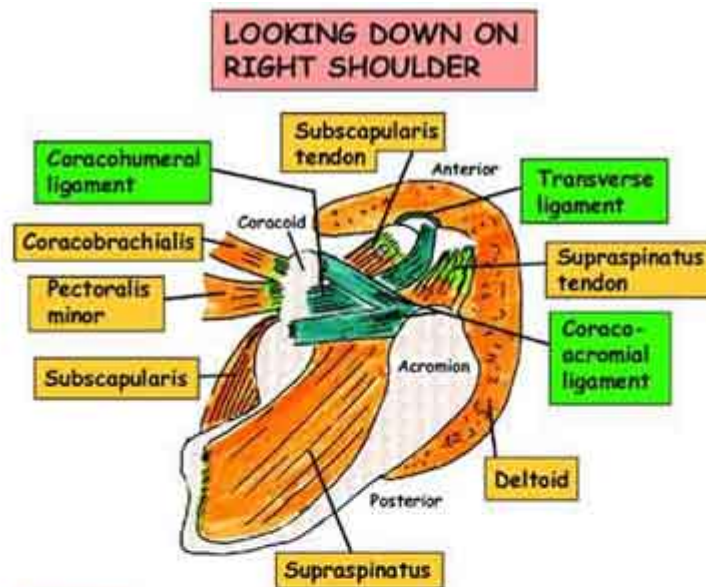
### Synovial

Atypical (fibrocartilage on joint surfaces)  
Fibrocartilaginous disc dividing it into 2 cavities  
Manubrial surface is concave  
Ball & socket (all the features of)  
Disc attached to capsule, acts as shock absorber  
Capsule thick above and posteriorly  
Fulcrum at costoclavicular ligament  
Clavicle rotates 40°  
Nerves: supraclavicular (C3,4)

### Ligaments

Thickening of capsule (above and posteriorly)  
These are the anterior & posterior sternoclavicular ligaments  
Interclavicular  
Costoclavicular (strong). External (anterior) fibres &  
Internal (posterior) fibres

## Appendix D Shoulder Complex



### Relations

Superior: Supraspinatus, bursa, long head of biceps, coraco-acromial ligament

Inferior: Long head of triceps, axillary nerve, posterior circumflex humeral artery, teres major

Posterior: Infraspinatus, teres minor, deltoid

Anterior: Subscapularis, bursa, deltoid

### Movements

Flexion: Pectoralis major, biceps, coracobrachialis, deltoid

Extension: Deltoid, latissimus dorsi, teres major

Adduction: Pectoralis major, latissimus dorsi, teres major

Abduction: Supraspinatus (0-30°), deltoid & supraspinatus (30°-90°), scapular rotation, supraspinatus, deltoid (90° - 160°)

Internal rotation: Subscapularis, teres major, latissimus dorsi

External rotation: Teres minor, infraspinatus, deltoid

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