

Overhead and Behind The Back Shoulder Flexibility Skill Application, Key Points, and Basic Anatomy

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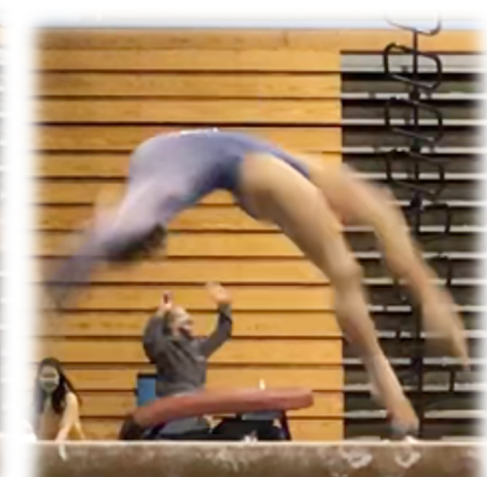
Why Do We Need Shoulder Mobility?

Extreme overhead positions very important in skills

Static - Shaping, rebounds, handstands, cartwheels and round offs, blocking

Dynamic - Arm swing in handsprings, vaulting, shoulder open/close bars, setting, trampoline direction and MANY more





Why Do We Need Shoulder Mobility?

Behind the back shoulder motion also very important

Front swings and hip extension

Running/sprinting

Unique arm/shoulder positions





Must Know Basic Anatomy To See Change

Step 1 is actually the upper back / thoracic spine

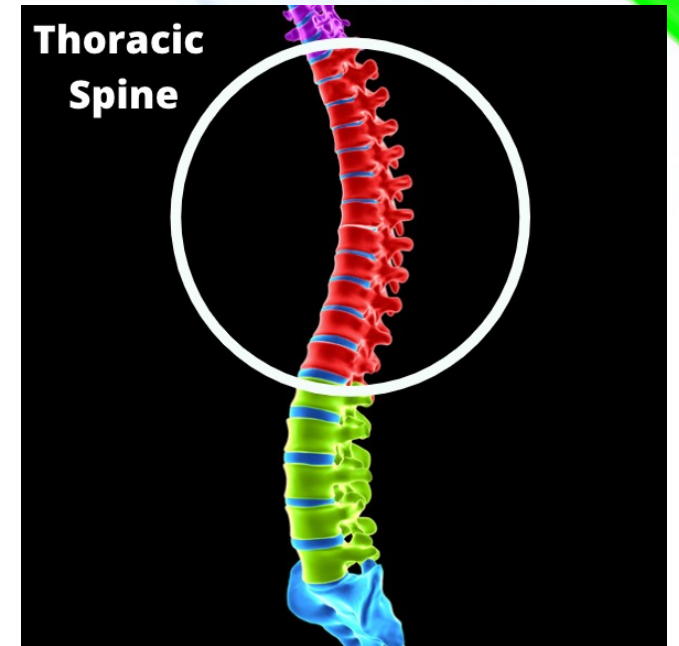
Full overhead shoulder motion requires upper back to open or extend

Upper back opens →

Shoulder blades move →

Shoulder joint moves →

Arms go overhead!





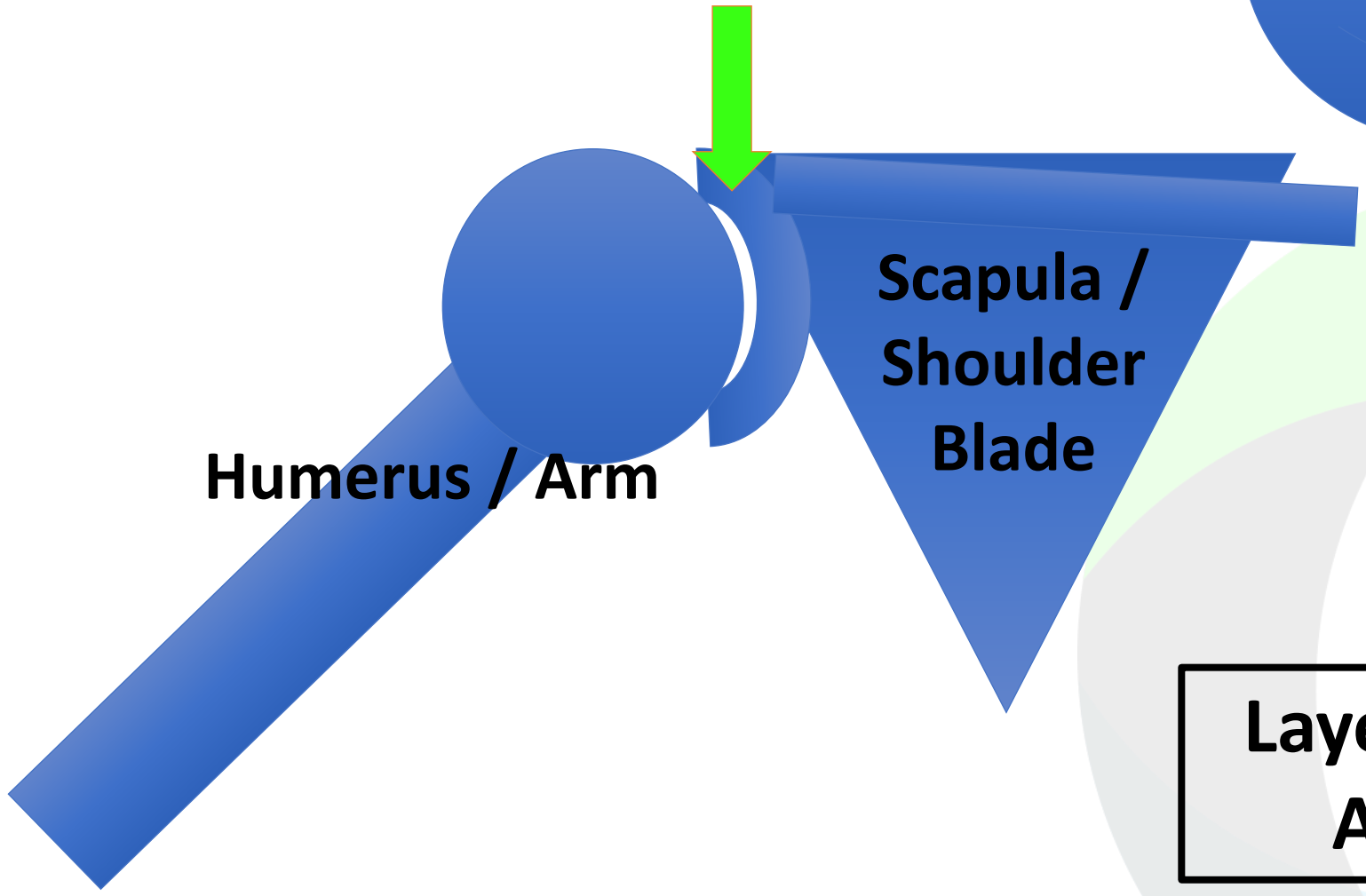
Limited upper back / thoracic spine
Mobility = arms can't go overhead fully



Full upper back / thoracic spine
Mobility = arms can go overhead fully

Research Articles []

**Glenoid / "socket"
(think golf ball on tee)**



Humerus / Arm

**Scapula /
Shoulder
Blade**

**Clavicle / Collar
Bone**

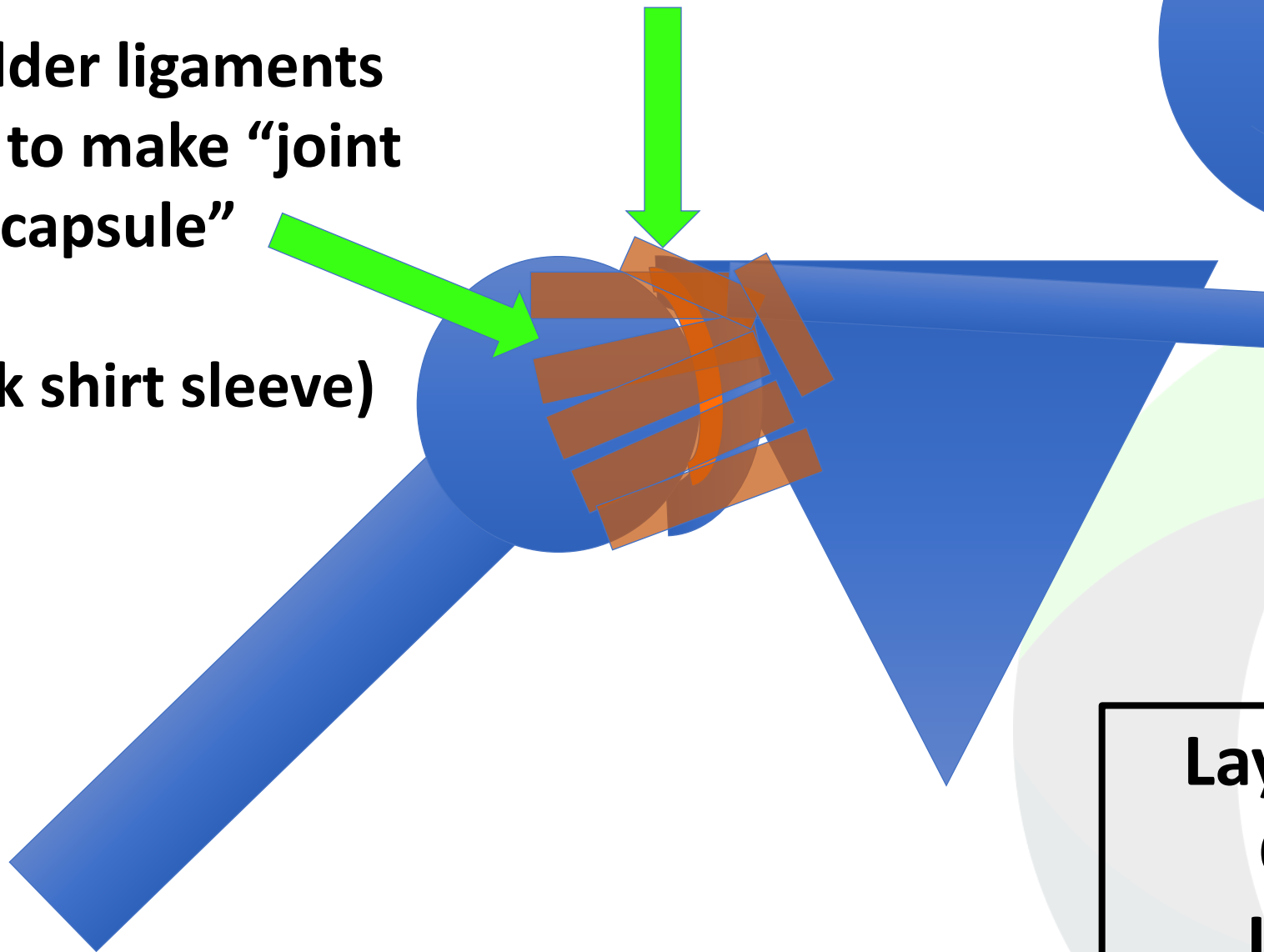
**Layer 1 – Boney
Alignment**

Research Articles []

**Shoulder ligaments
blend to make “joint
capsule”**

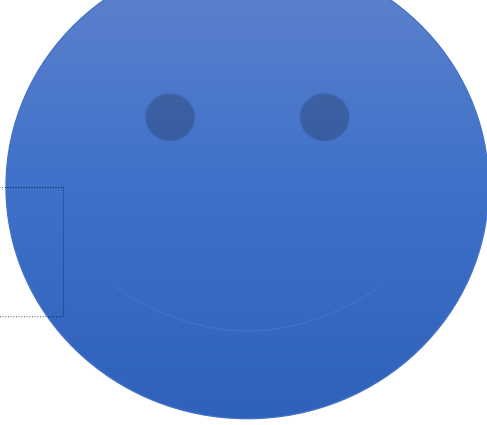
(think shirt sleeve)

Labrum



**Layer 2 – Joint
Capsule /
Ligaments**

“Rotator Cuff”



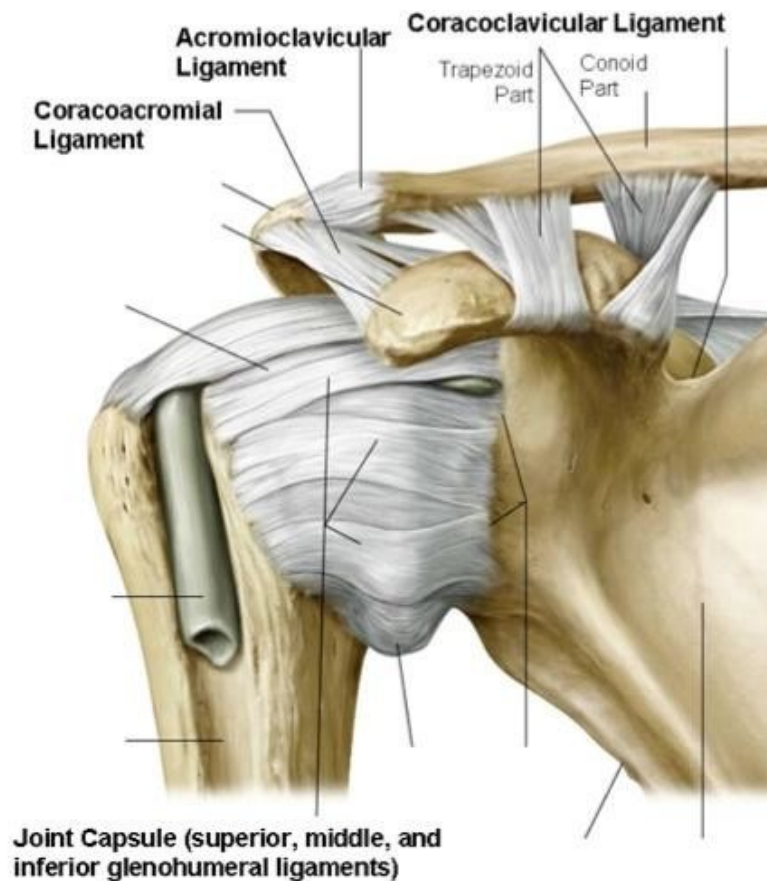
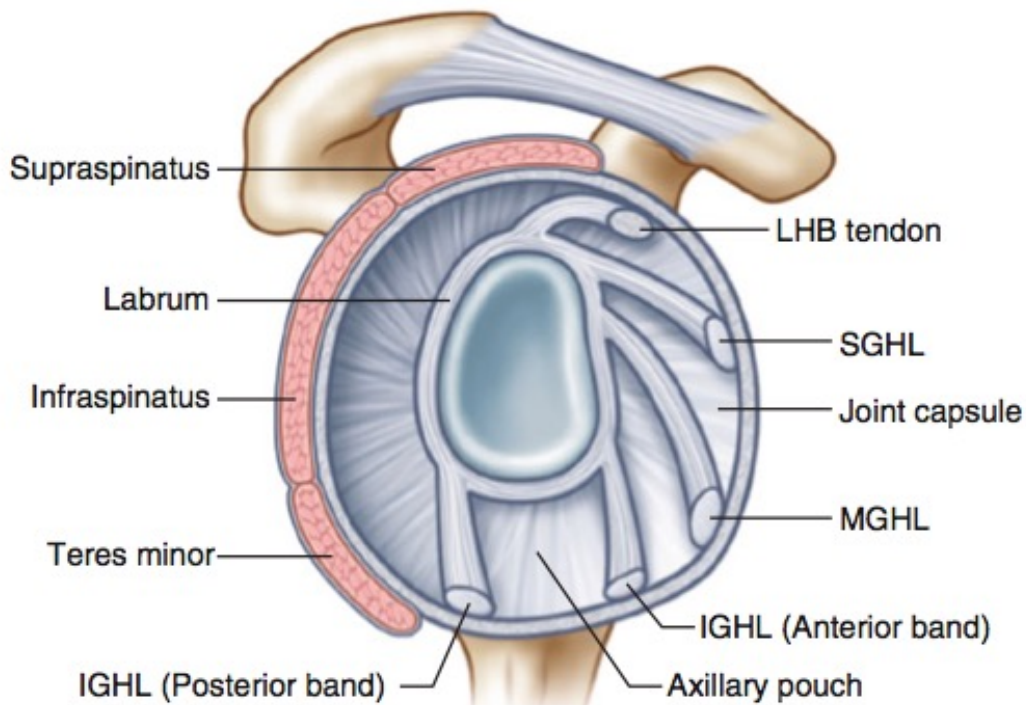
Biceps / Biceps Tendon, Triceps Behind



Lat
Teres Major

Layer 3 – Muscle / Tendon Support

6 Glenohumeral Instability



Research Articles []

Where Do I Get This Info?

Nonoperative and Postoperative Rehabilitation for Glenohumeral Instability

Kevin E. Wilk, PT, DPT, FAPTA^{a,b,c,*},
Leonard C. Macrina, MSPT, SCS, CSCS^{a,c}

KEYWORDS

- Proprioception • Shoulder instability • Rehabilitation • Return to function

KEY POINTS

- The glenohumeral joint relies on the dynamic stabilizers and neuromuscular control system to provide functional stability.
- Non-operative rehabilitation should be employed for most patients with glenohumeral instability, especially with multidirectional instability.
- The focus of the rehabilitation should be to maximize muscular strength, endurance while improving dynamic stability, proprioception and neuromuscular control.

INTRODUCTION

Rehabilitation Exercises for Athletes With Biceps Disorders and SLAP Lesions

A Continuum of Exercises With Increasing Loads on the Biceps

Ann M. Cools,^{††} PT, PhD, Dorien Borms,[†] PT, MSc, Simon Cottens,[†] PT, MSc, Marcia Himpe,[†] PT, MSc, Stijn Meersdom,[†] PT, MSc, and Barbara Cagnie,[†] PT, PhD
Investigation performed at the Department of Rehabilitation Sciences and Physiotherapy, Faculty of Medicine and Health Sciences, Ghent University, Ghent, Belgium

Background: Although rehabilitation exercises are recommended in the nonoperative and postoperative treatment of biceps-related disorders and superior labrum anterior-posterior (SLAP) lesions in overhead athletes, a progressive exercise protocol with controlled low to moderate loads on the biceps has not yet been described.

Purpose: To describe a continuum of exercises with progressive low to moderate loads on the biceps based on electromyographic (EMG) analysis.

Study Design: Descriptive laboratory study.

An Original Study

Multidirectional Instability of the Shoulder in Elite Female Gymnasts

Jill Caplan, MD, Terrill P. Julien, BS, James Michelson, MD, and Robert J. Neviaser, MD

ABSTRACT

Multidirectional instability (MDI) of the shoulder is symptomatic laxity in 2 or more directions, 1 of which is inferior. MDI is well described in overhead athletes (eg, baseball players, tennis players, swimmers) but not in gymnasts. We conducted this study to estimate the incidence of any type of shoulder pathology in elite gymnasts, to estimate MDI incidence in this population, and to determine which if any circumstances place these gymnasts at higher risk for developing MDI.

An 18-question multiple-choice questionnaire was administered to 70 female US collegiate gymnastic teams. Potential risk factors were cross-matched against those gymnasts with traumatic shoulder injuries and again against those gymnasts who met MDI study inclusion criteria.

Of the 1115 questionnaires distributed, 457 (34 teams) were returned. Twenty-two percent of gymnasts suffered from a traumatic shoulder injury, and 11% met study inclusion criteria. There was a statistically significant ($P = .02$) relationship between generalized ligamentous laxity and traumatic shoulder instability but not MDI. Incidence of atraumatic or traumatic shoulder injuries in gymnasts is higher than previously recognized. Although this study did not reveal any potential risk factors, it does provide several avenues for more specific research.

at increased risk for developing MDI, none of the literature has addressed which gymnasts are at risk and, more important, why they are at risk.

We conducted this study to estimate the incidence of any type of shoulder pathology in elite gymnasts, to estimate MDI incidence in this population, and to determine which if any circumstances place these gymnasts at higher risk for developing MDI.

"...none of the literature has addressed which gymnasts are at risk and, more importantly, why they are at risk."

MATERIALS AND METHODS

After obtaining institutional review board approval, we created 18 multiple-choice questions for a survey (Appendix) of US elite female collegiate gymnasts. The questions covered duration of participation in gymnastics, number of workout hours per week both before and during college, details of past and present shoulder problems and pain, and general

ARTICLE IN PRESS

Systematic Review

Multidirectional Instability of the Shoulder: A Systematic Review

Umile Giuseppe Longo, M.D., M.Sc., Ph.D., Giacomo Rizzello, M.D., Mattia Loppini, M.D., Joel Locher, M.D., Stefan Buchmann, M.D., Nicola Maffulli, M.D., M.S., Ph.D., and Vincenzo Denaro, M.D.

Purpose: To analyze outcomes of surgical and conservative treatment options for multidirectional instability (MDI).

Methods: A systematic review of the literature according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines was performed. A comprehensive search of the PubMed, MEDLINE, CINAHL, Cochrane, EMBASE, and Google Scholar databases using various combinations of the keywords "shoulder," "multidirectional instability," "dislocation," "inferior instability," "capsulorrhaphy," "capsular plication," "capsular shift," "glenoid," "humeral head," "surgery," and "glenohumeral" over the years 1966 to 2014 was performed. **Results:** Twenty-four articles describing patients with open capsular shift, arthroscopic treatment, and conservative or combined management in the setting of atraumatic MDI of the shoulder were included. A total of 861 shoulders in 790 patients was included. The median age was 24.3 years, ranging from 9 to 56 years. The dominant side was involved in 269 (58%) of 468 shoulders, whereas the nondominant side was involved in 199 (42%) shoulders. Patients were assessed at a median follow-up period of 4.2 years (ranging from 9 months to 16 years). Fifty-two of 253 (21%) patients undergoing physiotherapy required surgical intervention for MDI management, whereas the overall occurrence of redislocation was seen in 61 of 608 (10%) shoulders undergoing surgical procedures. The redislocation event occurred in 17 of 226 (7.5%) shoulders with open capsular shift management, in 21 of 268 (7.8%) shoulders with arthroscopic plication management, in 12 of 49 (24.5%) shoulders undergoing arthroscopic thermal shrinkage, and in 11 of 55 (22%) shoulders undergoing arthroscopic laser-assisted capsulorrhaphy. **Conclusions:** Arthroscopic capsular plication and open capsular shift are the best surgical procedures for treatment of MDI after failure of rehabilitative management. Arthroscopic capsular plication shows results comparable to open capsular shift. **Level of Evidence:** Level IV, systematic review of Level I to IV studies.

Glenohumeral Instability

6

6.1 Introduction

The structure of the glenohumeral joint allows for a large arc of shoulder motion. Since approximately one-fourth of the humeral head articular surface remains in contact with the glenoid throughout the range of shoulder motion [1], instability can result when static and/or dynamic stabilizers are disrupted. Static stabilizers include bony articular congruency, the glenohumeral ligaments, the glenoid labrum, the rotator interval, and the negative intra-articular pressure whereas dynamic stabilizers include the rotator cuff and periscapular muscula-

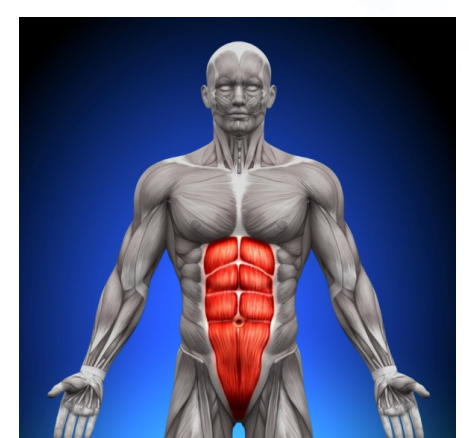
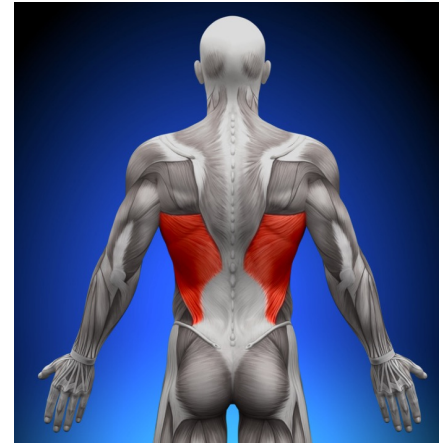
6.2 Anatomy and Biomechanics

6.2.1 Basic Structure and Function

The balance between mobility and stability of the glenohumeral joint is achieved through the coordinated, complex interactions between multiple static and dynamic stabilizers that function to center the humeral head within the glenoid fossa throughout the full range of shoulder motion. Static constraints include articular congruency, glenoid version, the coracoacromial arch, the gle-

What Commonly Limits Overhead Flexibility?

Upper back extension
Latisimus/Teres Major muscle
Pec major/Pec minor muscle
Shoulder blade strength
Core strength/control
Technique



Upper Back Screening

Press Up – Even upper back curve

Seated Turn – 50+ degrees rotation





Pass = Even / Full Curve



Not Pass = Hinge / Not Full Curve



Pass = Past Block Edge
or $> 50+$ degrees

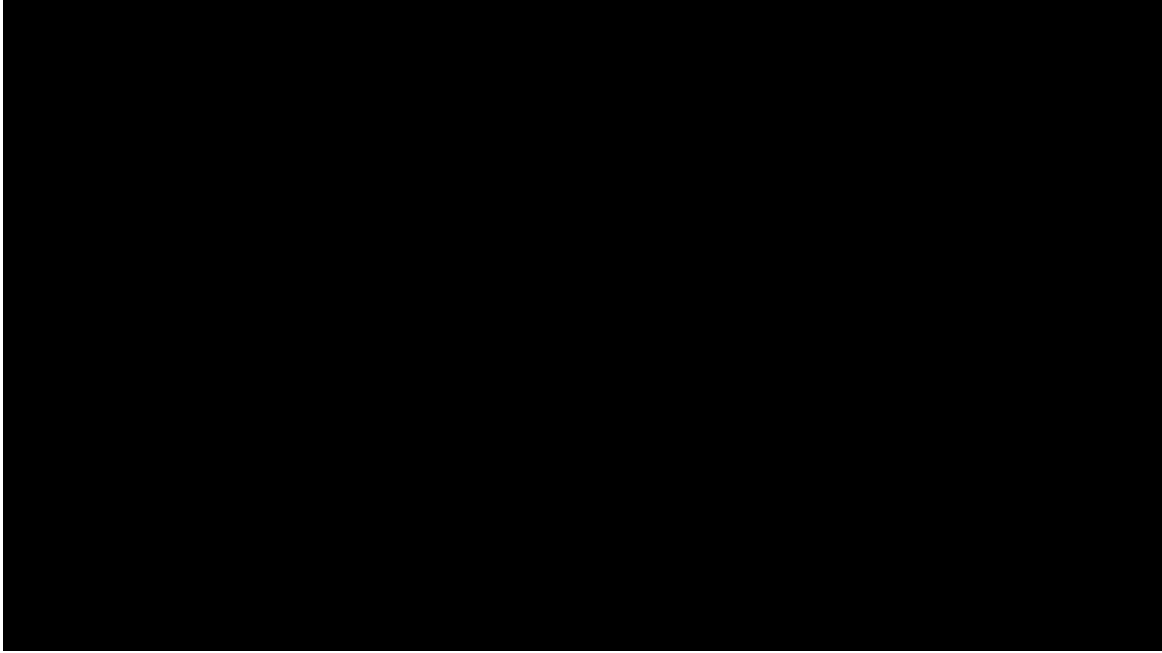


Not Pass = Not Past Block
Edge or $< 50+$ degrees

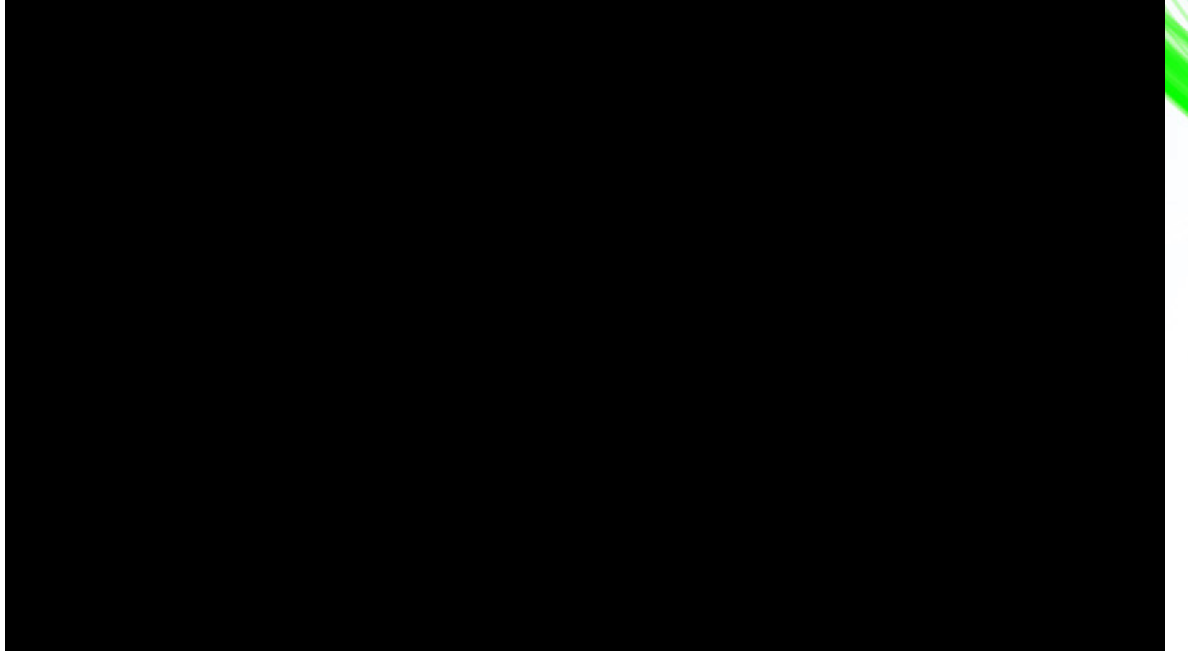
Upper Back Soft Tissue/Stretching

Foam roller extensions
Windmills





Foam Roller Extensions



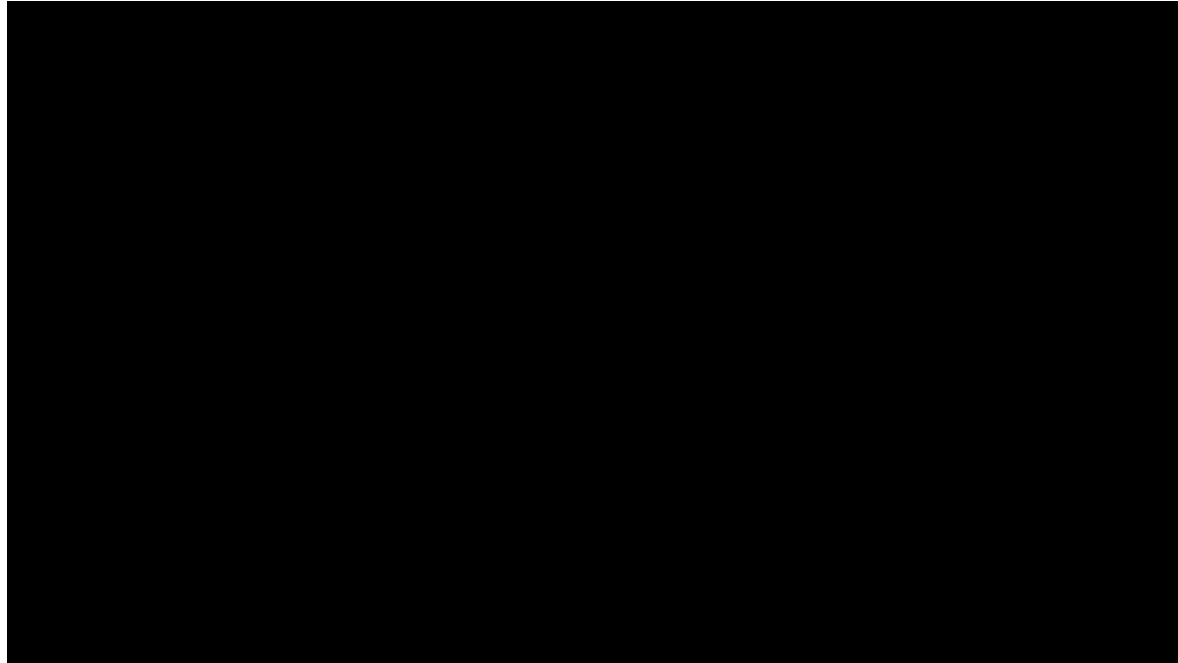
Windmills





Upper Back Active Flexibility Drills

Hands and Knees Turns
“Uppers” with PVC Stick



Hands and Knees Turns



Uppers

Overhead Shoulder Screening

Looking at soft tissue limitations

Seated with back/head on wall

Palms down, up, and together

Pass = touches wall all 3 positions





Pass = Touch Wall In
All Grips



Not Pass = Can't
Touch Wall In All Grips

Shoulder range **gets worse with front / narrow grip**

Focus underarm, upper back, chest muscles then appropriate active flexibility drills

All looks good, **but not showing up in skills**

Focus upper back strength, active flex, technique

Overhead Shoulder Flexibility Soft Tissue/Stretching

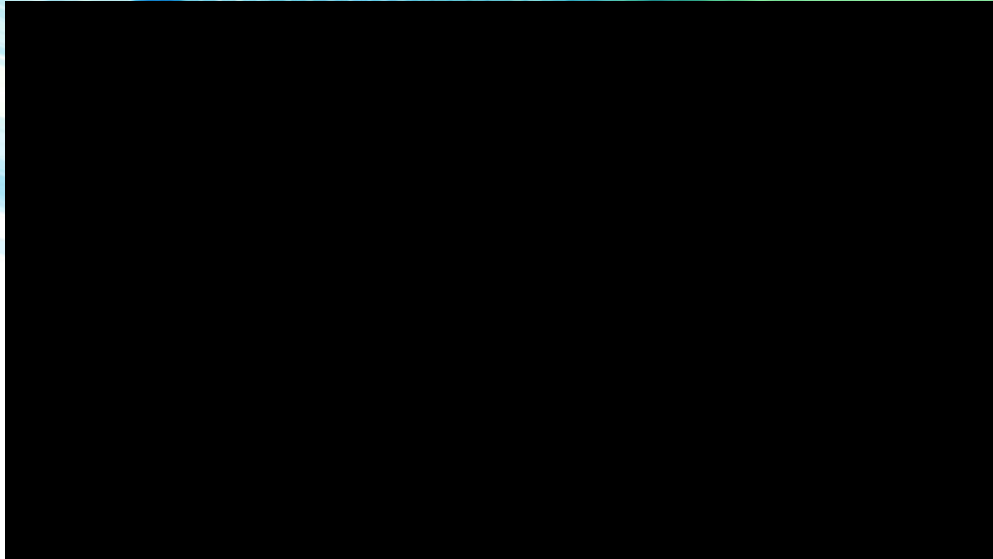
Foam roll lats

Lacrosse ball teres/pec

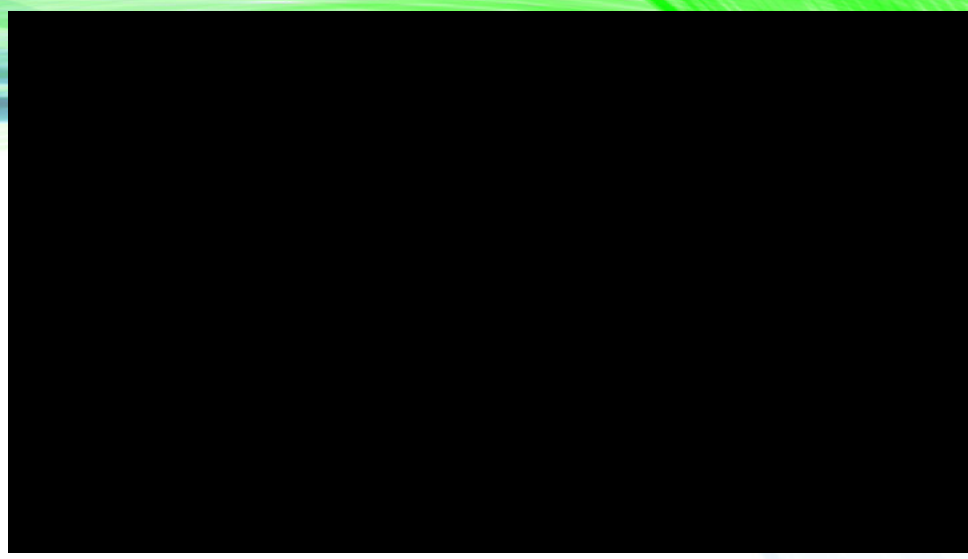
PVC stick stretch lats

Floor chest stretch





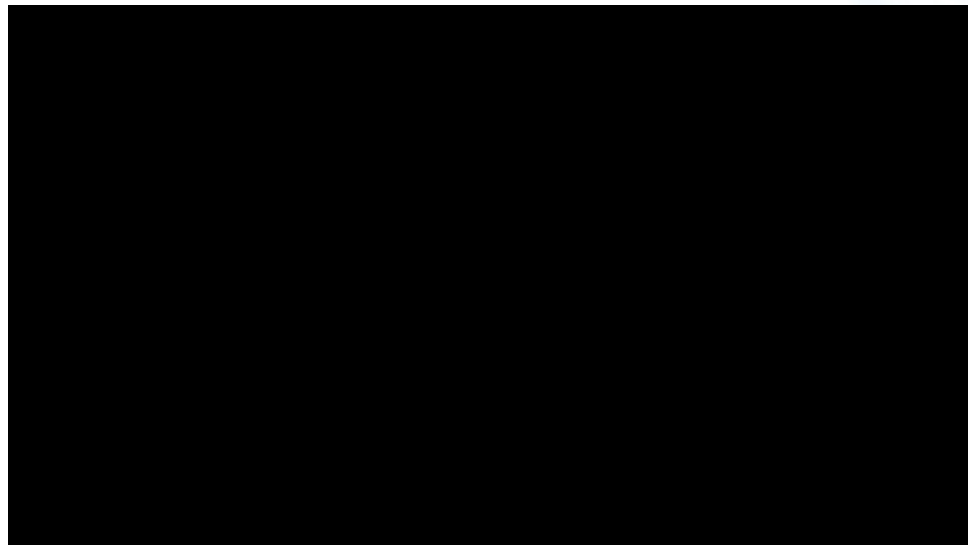
Foam Roll Lats/Teres



Lacrosse Ball Teres



PVC Stick Stretch

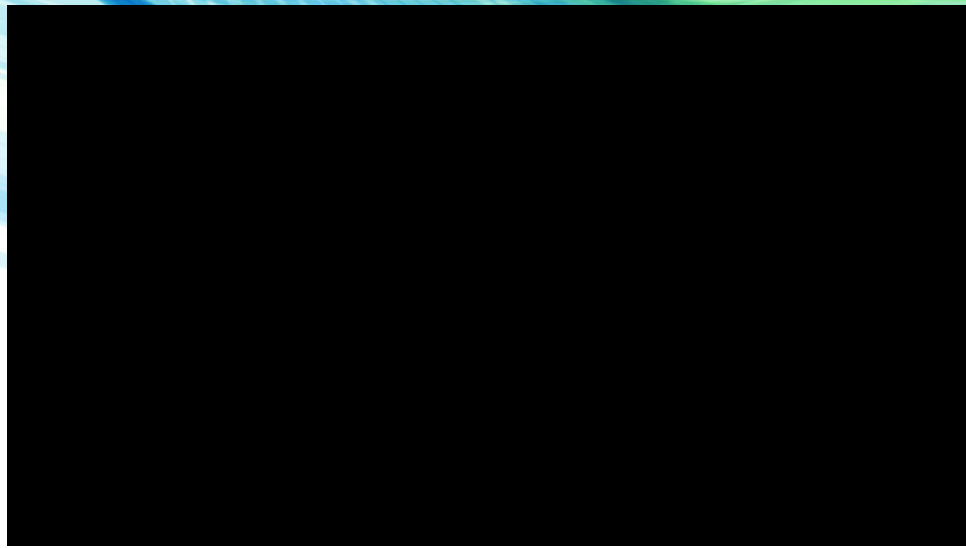


Floor Chest Stretch

Overhead Shoulder Flexibility Eccentrics/Active Flex

Eccentric pull ups
Eccentric push ups
Wall/Floor Angels
Stomach Shoulder Circles

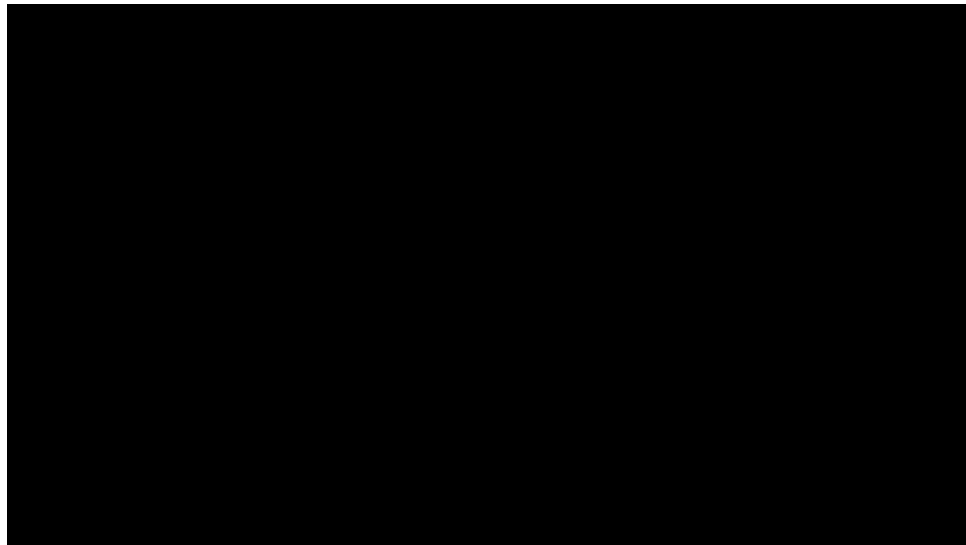




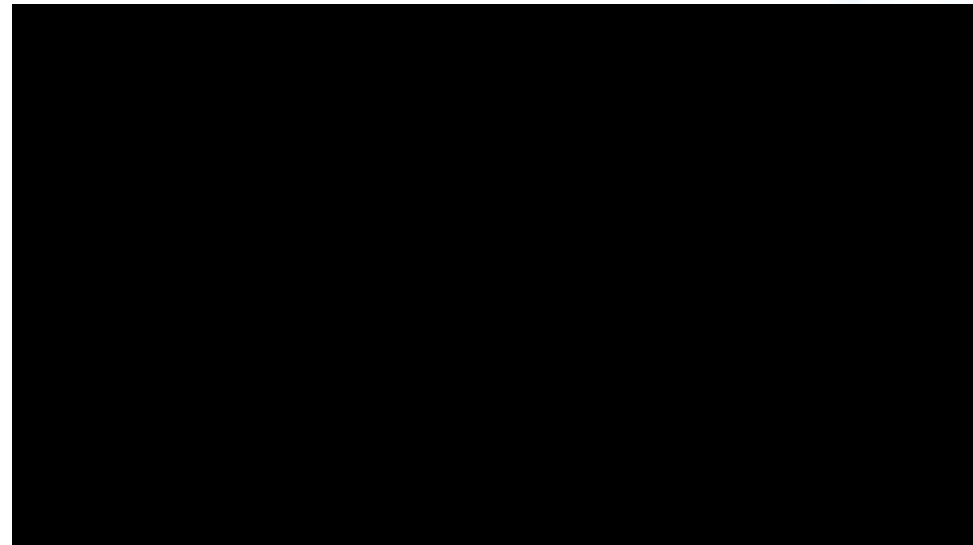
Eccentric Pull Up Lowers



Eccentric Push Up Lowers



Wall Angels



Stomach Shoulder Circles

Overhead Shoulder Flexibility Drills/Skill Basics

Wall Press Drill

Back Extension Rolls

Wall Tight Arch Handstand

Step Back Rebound Drill





Wall Press Drill



Back Extension Rolls



Wall Tight Arch Handstand



Step Back Rebound

Overhead Shoulder Flexibility Complex Example

2-3 Rounds

1. 30s Foam Roll/Lacrosse Ball Underarm
2. 10 Upper Back Extensions over Roller
3. 30s PVC Stick Stretch & Chest Stretch
4. 5 Eccentric Chin Ups, 5s lower, 5s hold
5. 10 Stomach Shoulder Circles
6. 30s Wall Facing Tuck HS

Behind The Back Shoulder Screening

Table top = 90+ degree angle and hips open

*Hands and knees shoulder circle also good screen for single arm





Pass = 90 degree shoulder
and open hips

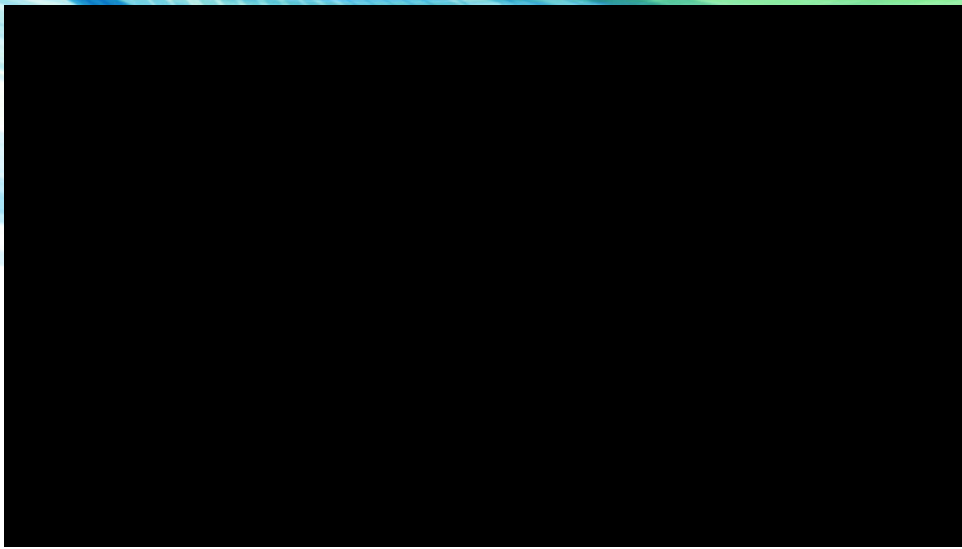


Not Pass = > 90 degree shoulder
and open hips not open

Behind The Back Soft Tissue/Stretching

Foam roll lats
Lacrosse ball pecs
Chest openers on roller
Hands behind back squeezes





Foam Roll Lats



Lacrosse Ball Pecs



Chest Openers

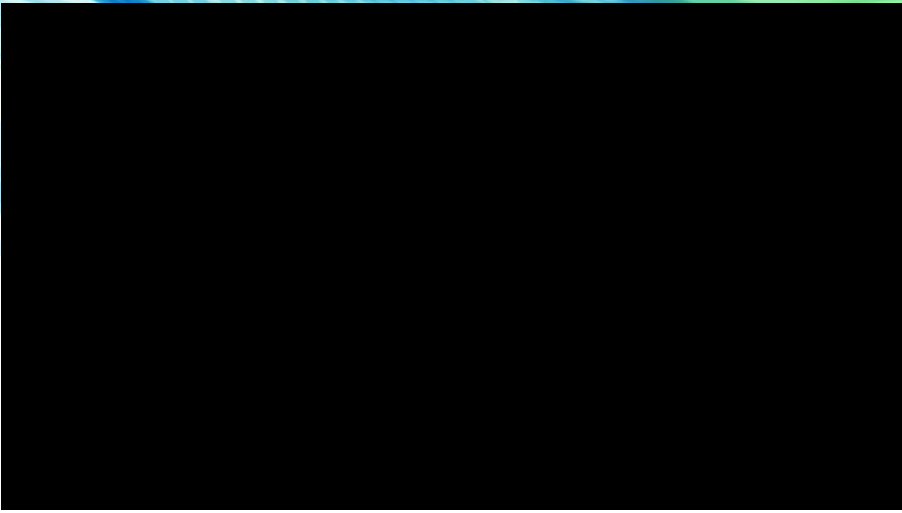


Hands Behind Back Squeeze

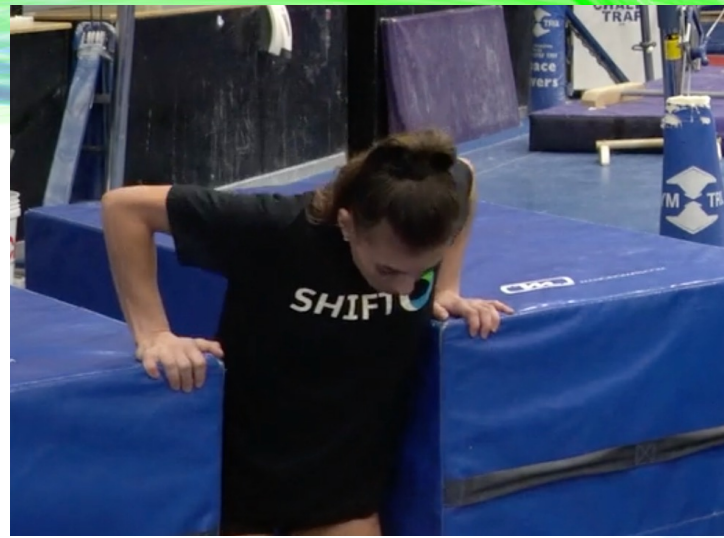
Behind The Back Eccentrics/Active Flex

Eccentric planche slider crawls
Eccentric dips
Hands and knees wall circles
Crab Walks





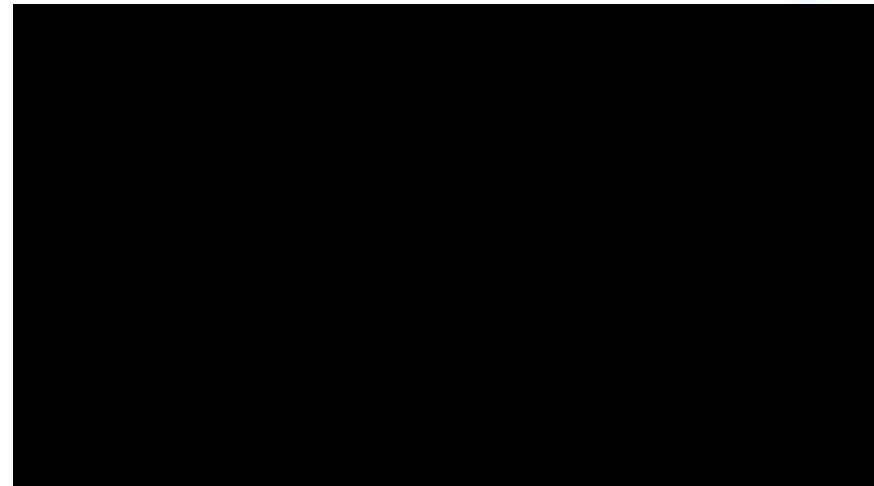
Eccentric Slider Crawl



Eccentric Dips



Hands and Knees Circles



Crab Walks

Behind The Back Shoulder Flexibility Complex Example

2-3 Rounds

1. 30s Foam Roll/Lacrosse Ball Underarm
2. 30s Lacrosse Ball Chest
3. 30s PVC Lat Stretch and Behind Back Stretch
4. 5 Eccentric Skin The Cat Slide Outs, 5s lower and 5s hold
5. 10 Stomach Shoulder Circles
6. 10 power swings on parallel bars

Shoulder Flexibility Strength Balance

2x/week of 3-4 sets of 8-12

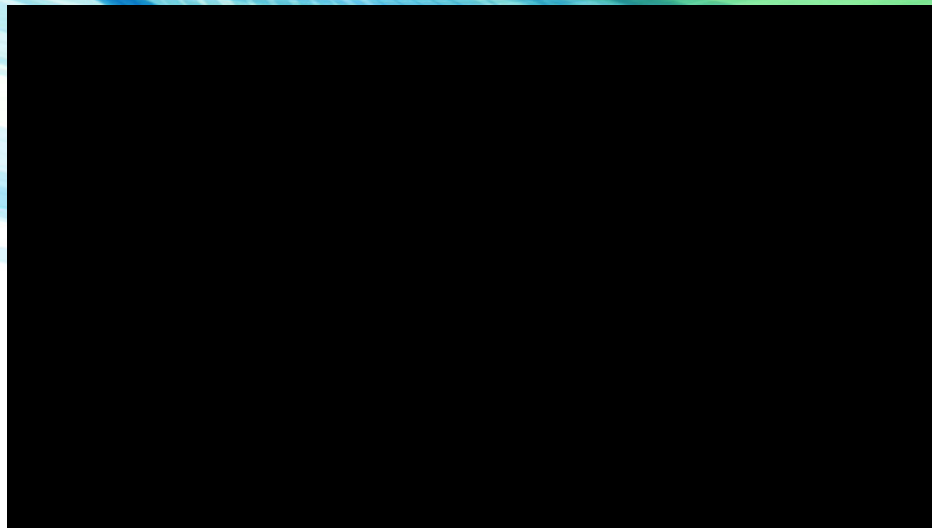
Feet elevated rows

Face Pulls

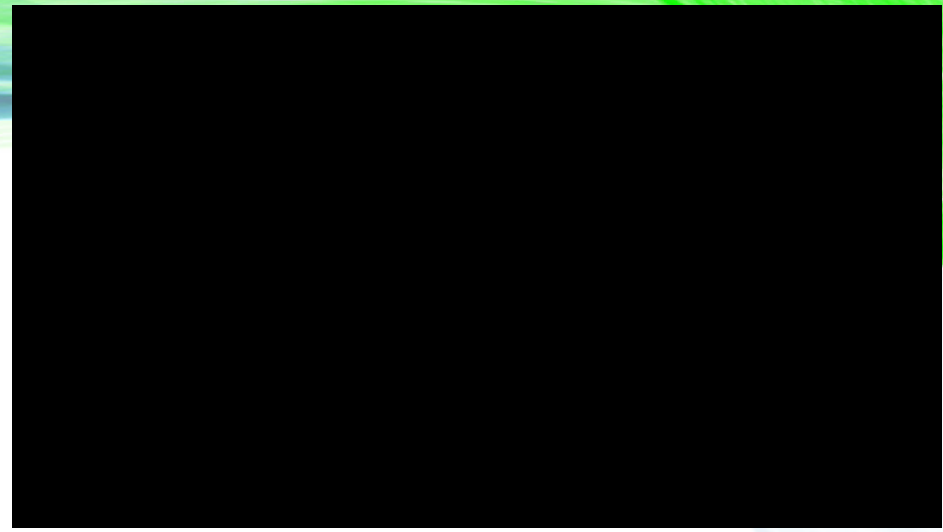
Renegade Rows

Bent Over Dumbbell Rows

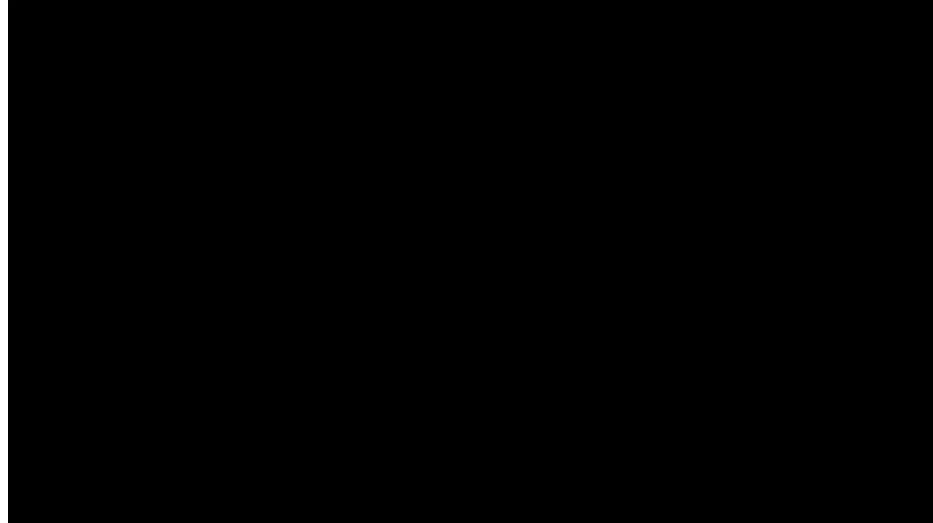




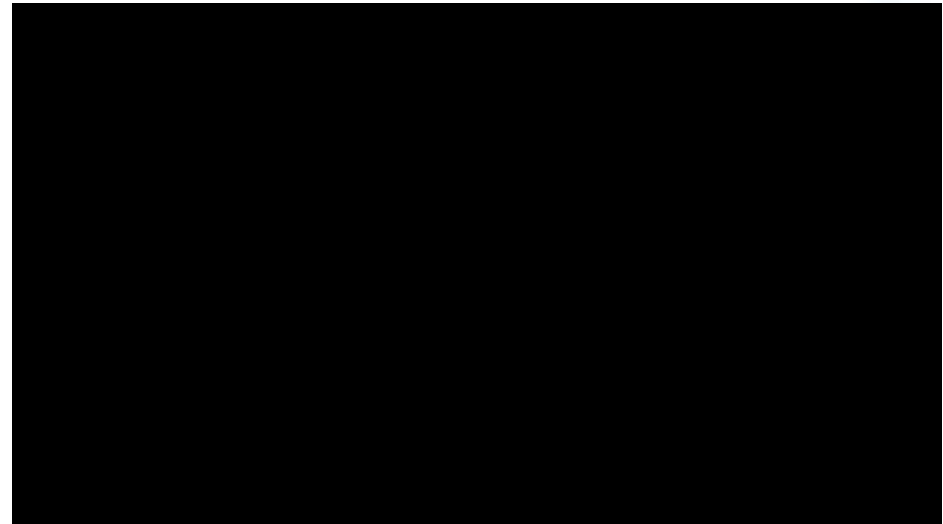
Feet Elevated Rows



Face Pulls



Renegade Rows



Dumbbell Rows

What About Extreme Motions?

Have to develop this motion for skills! Inevitable

Bias muscle in flexibility work first

Then get VERY good strength, control, & basics

Use drills and technical progressions to slowly develop range of motion



Are These Shoulder Stretches Bad?

Some just not optimal, some yes

Bias stretch on ligaments, not muscles

Might irritate joints, over time contribute to instability and injuries

Better to go above focus, then use skill work and active flex to develop larger motions

Reinold 2013, Wilk 2008, Wilk/Macrina 2013

