

Protecting the Throwing Athlete

Considerations for Baseball and Softball Training

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TCU Baseball

ScapuloHumeral Rhythm

Weakness Here

- Main Scapular Stabilizers
 - Rhomboids
 - Inability to get retraction = Anterior capsule
 - Large ECC activation during the throw
 - Levator Scapulae – GF Inferior
 - Traps
 - LT-Posterior tilt
 - Serratus Anterior – Winging decreases acromial elev. = IMP

Injuries Here

- Glenohumeral Protectors
 - Rotator Cuff
 - Subscapularis
 - Teres Minor
 - Infraspinatus
 - Supraspinatus

“Most shoulder complex injuries incurred as a result of sport activities can be traced to abnormal biomechanics, which, in turn, can be related to improper functioning of the scapular muscles.¹ In fact, scapular instability is found in as many as 68% of rotator cuff problems and 100% of glenohumeral instability problems.^{1, 2}”

¹The role of the scapula in athletic shoulder function. Kibler WB. Am J Sports Med. 1998 Mar-Apr; 26(2):325-37

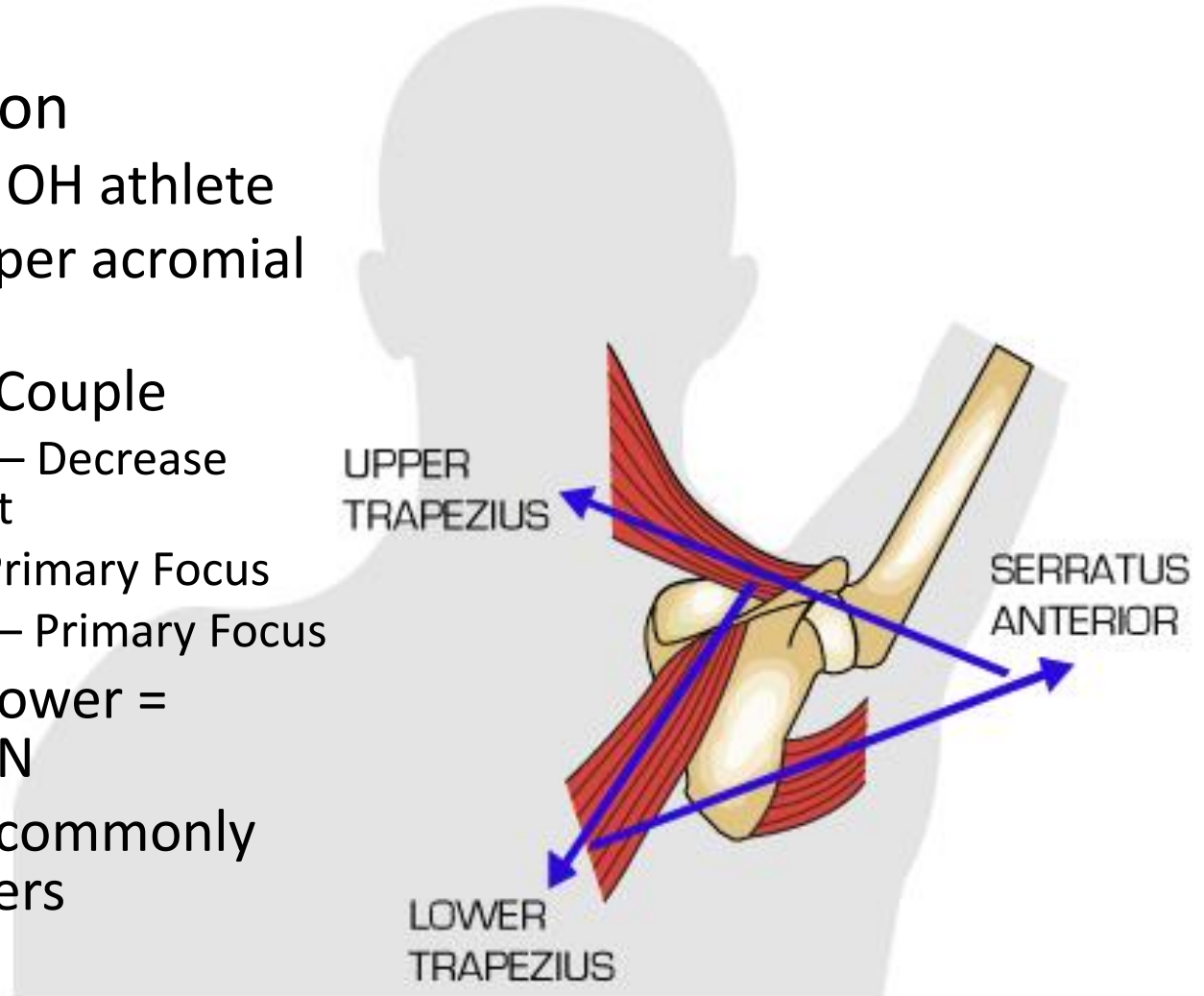
²Scapulothoracic motion in normal shoulders and shoulders with glenohumeral instability and impingement syndrome. A study using Moiré topographic analysis. Warner JJ, Micheli LJ, Arslanian LE, Kennedy J, Kennedy R. Clin Orthop Relat Res. 1992 Dec; (285):191-9

Scapular Control

- What is it???
 - You've heard this and said WTF
 - MOST IMPORTANT ASPECT FOR INJURY PREVENTION
- 1. Eliminate Compensations
 - Major compensation is the rib flare
 - Addition of FR
- 2. Control Movement
 - Tempo
 - ISO / ECC especially
- 3. Mind Muscle Connection
 - Understand movement
 - Visualize firing patterns

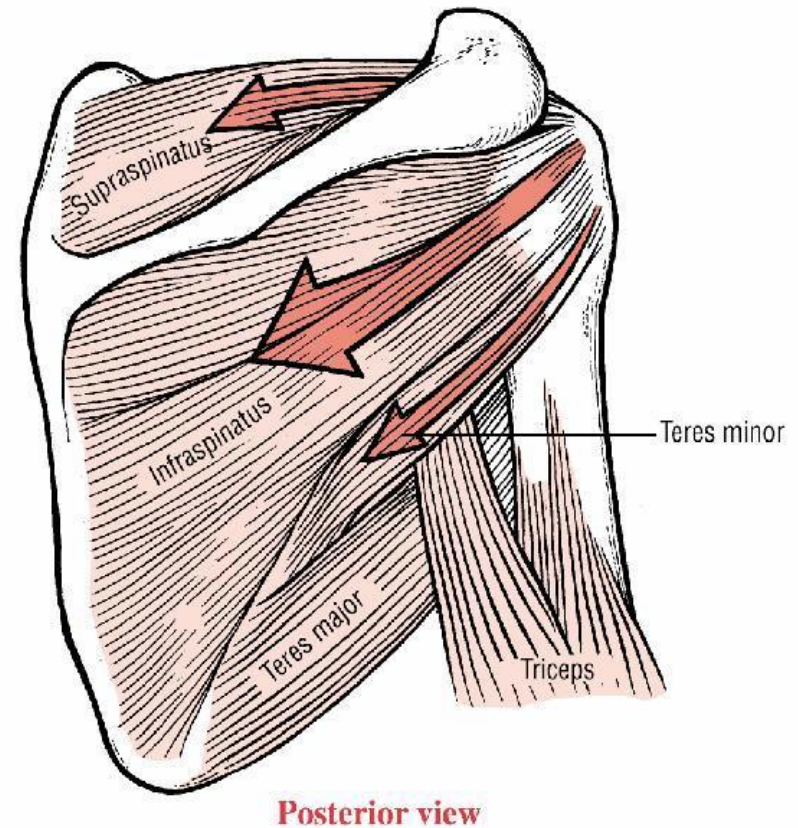
Scapula

- Upward Rotation
 - Huge for any OH athlete
 - Need for proper acromial elevation
 - 3 Way Force Couple
 - Upper Trap – Decrease Involvement
 - Serratus – Primary Focus
 - Lower Trap – Primary Focus
 - Upper over Lower = DYSFUNCTION
 - LT / SA most commonly weak stabilizers



Rotator Cuff

- 2 Functions
 - Depress and Stabilize
 - Counteract the deltoid
- We do no direct deltoid work
 - Overpowers
 - Humeral elevation
 - Subacromial space
 - Primary / External Impingement
- We don't do IR either



Rotator Cuff

- No IR
 - Already heavily trained
 - Large powerful muscles
 - Pec / Lats
 - Isolate Subscapularis at times
- Release and Strengthen
- Total Body Rotator Cuff
 - Add movement complexity to ordinary cuff work
 - Glute Activation / SL work / Movement Patterning
 - All good things for throwing athletes
 - Able to integrate heavier loading

Rotator Cuff

- Static Stability
 - Standard tempo cuff
 - ECC-ISO-DYN
 - 10ISO / 10-15R
 - 4ECC x 8-10R
 - ALT 10ISO/10-15R
- Dynamic Stability
 - Reactive stabilization in all planes
 - Proprioception and kinesthetic awareness
 - Can make it position specific
 - Static Work w/ DYN STAB

Y's on FR



ISO T / DYN Y



ISO Cobra / DYN ER



Static – SL Flexion / Ext



Static – Squat w/ ER @ 0



Static – SL Squat w/ ER @ 90



SL Flex / Ext w/ DYN STAB



Band L's w/ DYN STAB



Serratus Anterior

- Janda first noted tendency for weakness
 - Upper Crossed Syndrome
 - These postural changes decrease glenohumeral stability as the glenoid fossa becomes more vertical due to serratus anterior weakness leading to abduction, rotation, and winging of the scapulae. This loss of stability requires the levator scapula and upper trapezius to increase activation to maintain glenohumeral centration (Janda 1988) ¹
- Often times very undertrained
- Chicken vs the egg
- Bench Press vs DB Bench Press vs Pushups

¹ <http://www.jandaapproach.com/2011/01/10/janda%E2%80%99s-classification-of-muscle-imbalance-patterns/#sthash.BCvFGhZT.dpuf>

Training the Serratus Anterior

- Don't use unstable objects ¹
 - Actually decreases activation
 - Know your goal
- Scap Pushup / Push Up Plus / DB Press Outs
 - Is this all there is???
- Elevated Scap Pushups
 - Greatly increases activation
 - Breath Cycles
 - Reps
 - Body Angle
- Serratus Wall Slides
 - Foam Roller
 - ER w/ Band



¹ Piraua, Andre. Electromyographic analysis of the serratus anterior and trapezius muscles during push-ups on stable and unstable bases in subjects with scapular dyskinesis. [Journal of Electromyography and Kinesiology](#). 10/2014

Serratus Anterior

- Overhead Shrugs
 - Bands
 - Eliminates the evil LS
- Banded Pushup Jumps
 - One of the best things I've ever found to get to know your serratus
- Serratus Pull Aparts
 - Bands or Cables or Combo
- Band / Cable Elevators
 - Shon Grosse has great progression
 - Seated to Standing

Serratus Pull Aparts



Band / Cable Elevators



Pec Major and Minor

- Overactive
 - Upper Crossed Syndrome
 - Scapular and Humeral position
 - Anterior Tilt and the Sub acromial Space
 - Bicep Tendonitis???
 - Pec insertion crosses bicipital groove
- Loss of IR and Injury
- New research is showing just as much evidence to loss of ER and a correlation to shoulder/elbow injury

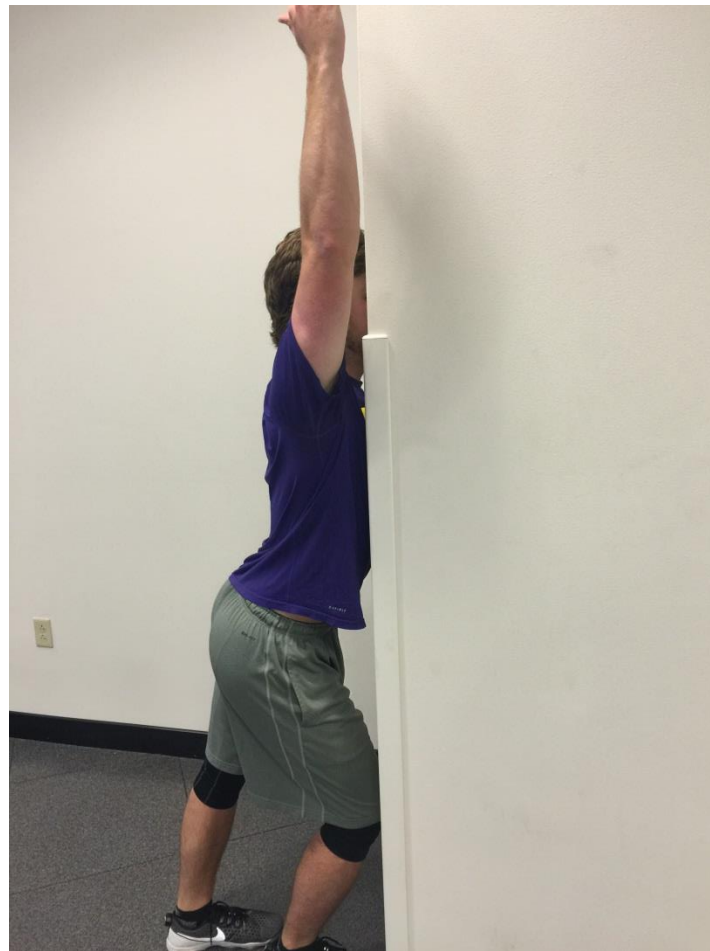
Pec Major and Minor

- Questions that arise with the bench press
 - The most evil of them all?!?!?
 - If can't maintain scapular control and stability
 - Can cause problems
 - Floor Press
 - 90 degrees???
 - Pushup Variations
 - Much more scapular involvement
 - Serratus
 - Complex movement
 - Core component

Pec Minor Release w/ Barbell



Pec Minor Release w/ LaX Ball

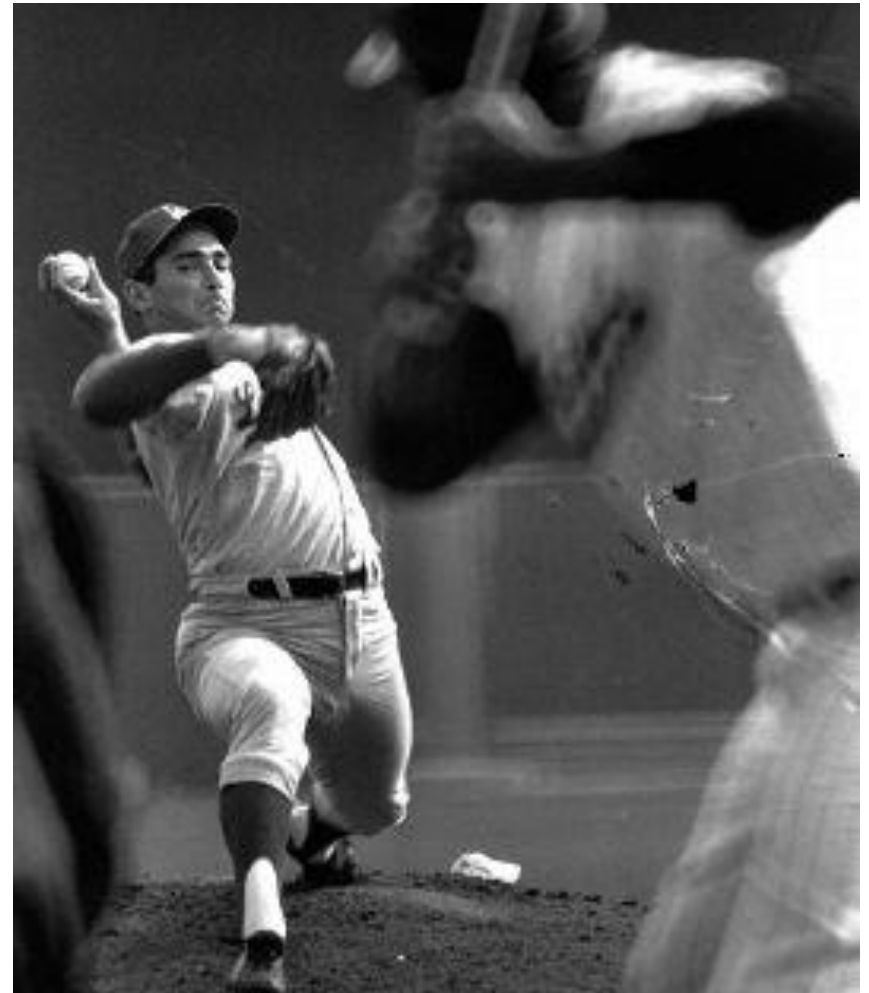


Pec Minor Release on FR



T-Spine

- Obvious to rotational sports
 - Extension and Rotation
 - Activation for IO / EO
- Addition of breathing to movement patterns
- Focus on ribs
- Lying T-Spine progressions #1 #2 #3
 - 2011 CSCCa presentation



T-Spine

- Rep Schemes
 - 3-5 Reps w/ Breathing Cycles
- Create torque vs object for hard structures = Mobility
- Light pressure vs object for soft tissue activation
 - IO / EO



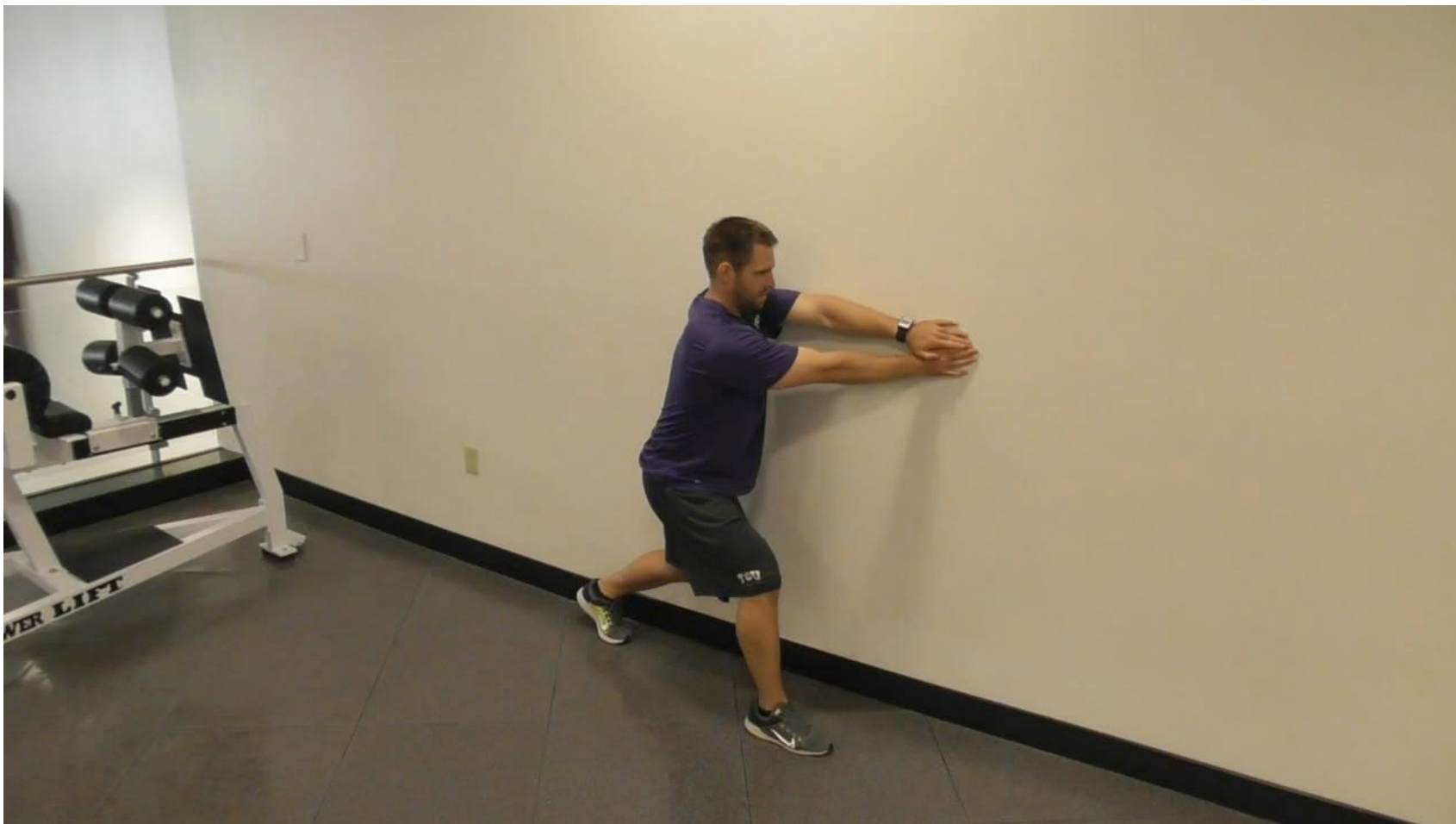
Hip Rot w/ TSP towards wall



Hip Rot w/ TSP away from wall



SL Lunge Rotations on Wall



SL Lunge Rotations on Wall



Hip IR and the Throwing Athlete

- Motion in all planes
- Everybody trains hip extension but is rotation more important?
 - IR / ER activates receptors in ant & post capsule
 - Flexion / Ext excites less than 3% of the capsular receptors
- We train more rotation @ the hip more than extension
- Muscles in the hip
 - 19+ Used for Rotation
 - 9 Used for Flex/Ext



Hip IR and the Throwing Athlete

- Throwing athlete – especially pitchers
 - Front side landing leg
 - Get over front hip
 - Power pitchers back leg
 - Problems???
 - Difficulties w/ IR
 - Create / Aggravate FAI
 - Bony Anatomy
 - PRI???
1. Soft Tissue
 2. Mobilize
 3. Movement Prep
 4. Activation



1. Soft Tissue

- Glutes / ER's

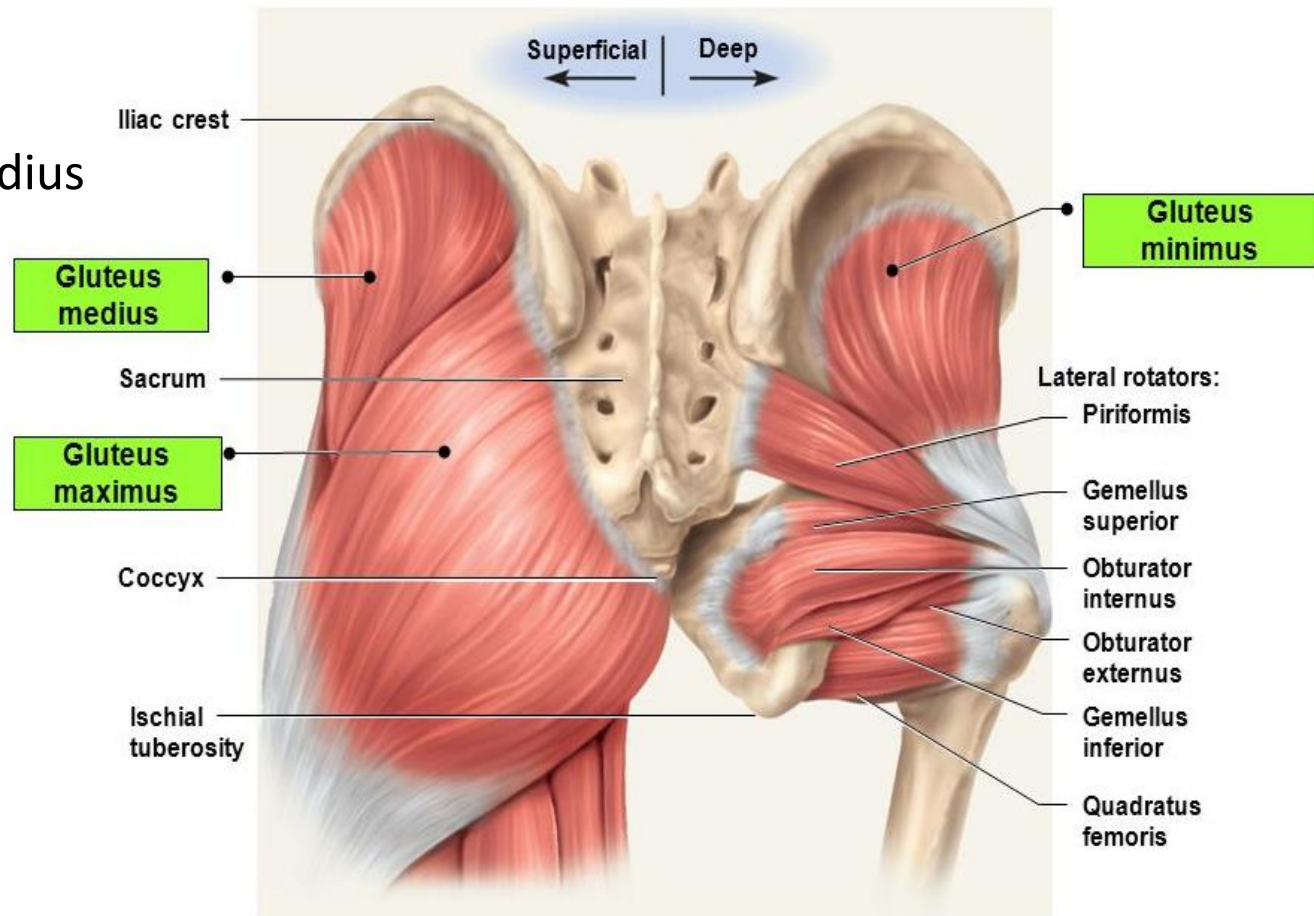
- Glutes

- Especially Medius

- Deep Rotators

- TFL

- Foam Roll
- LaX Ball
- Baseball
- Softball
- Shotput



2. Mobilize

- Posterior Capsule
 - Release to increase IR
 - Traction
 - Posteriorly
 - Laterally
- Extension w/ IR
 - Traction
 - Laterally
 - Anteriorly
- Flexion w/ IR
 - Difficult
 - Traction
 - Lateral /
 - Posterior



2. Mobilize

Posterior Capsule

Extension w/ IR



3. Movement Prep



4. Activation

- Band Clamshell
 - IR / ER
 - Watch compensations
- Hip Airplane
 - Stuart McGill
 - Great intro into SL RDL variations
 - Progression
- SL Squats into Various Planes
 - Touches w/ Hands and Feet

Hip Airplane



Thank you

- CSCCa
- TCU Strength and Conditioning Staff
- TCU Baseball
- Ben Hogan Sports Medicine

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