

Evaluation and Rehabilitation Specific to the Elbow in the Overhead Throwing Athlete

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MY BACKGROUND...

- 15+ years of Baseball experience
- Worked at Division 1, 2, 3
- Athletic Trainer for 2006 (U16) and 2010 (U18) USA Baseball National Teams
- Pitching Coach/Athletic Trainer at The University of Wisconsin-Stout (2006-2007)
- Baseball ATC at The University of Alabama from 2007-2017
- Currently at Concordia University – St. Paul
- So, why leave Alabama???

HERE'S WHY!



BUT, IT IS MINNESOTA, SO...

- Playing baseball in 30 degrees isn't as fun as it sounds.
- That was March 31st.
- And I was dressed similar to this



WHEN EVALUATING A THROWER...

ELBOW

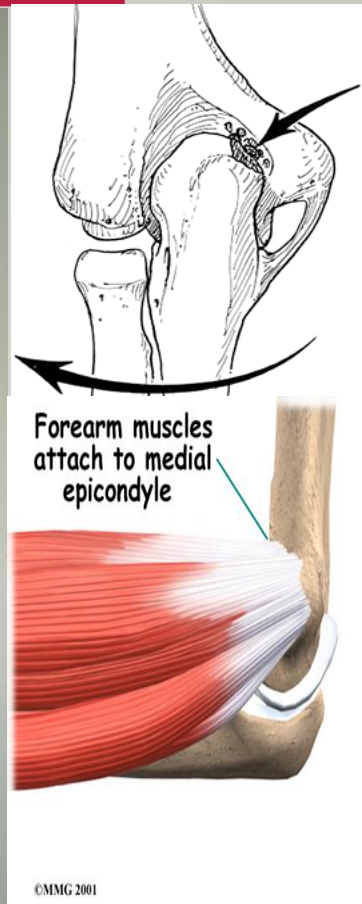
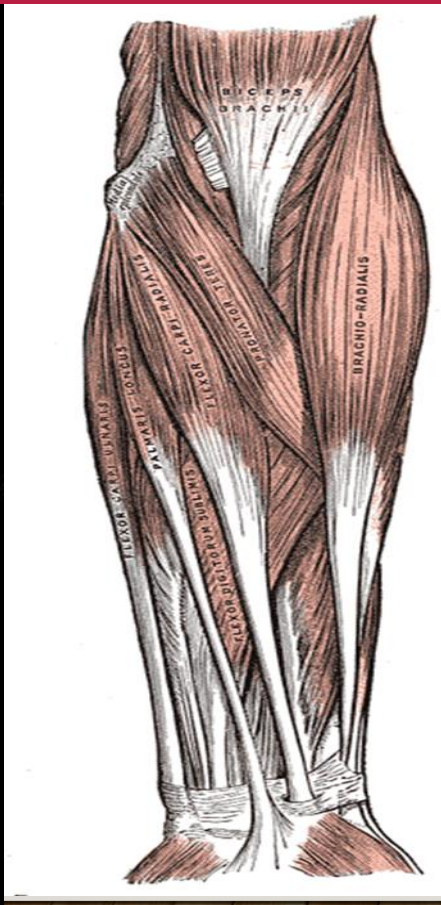
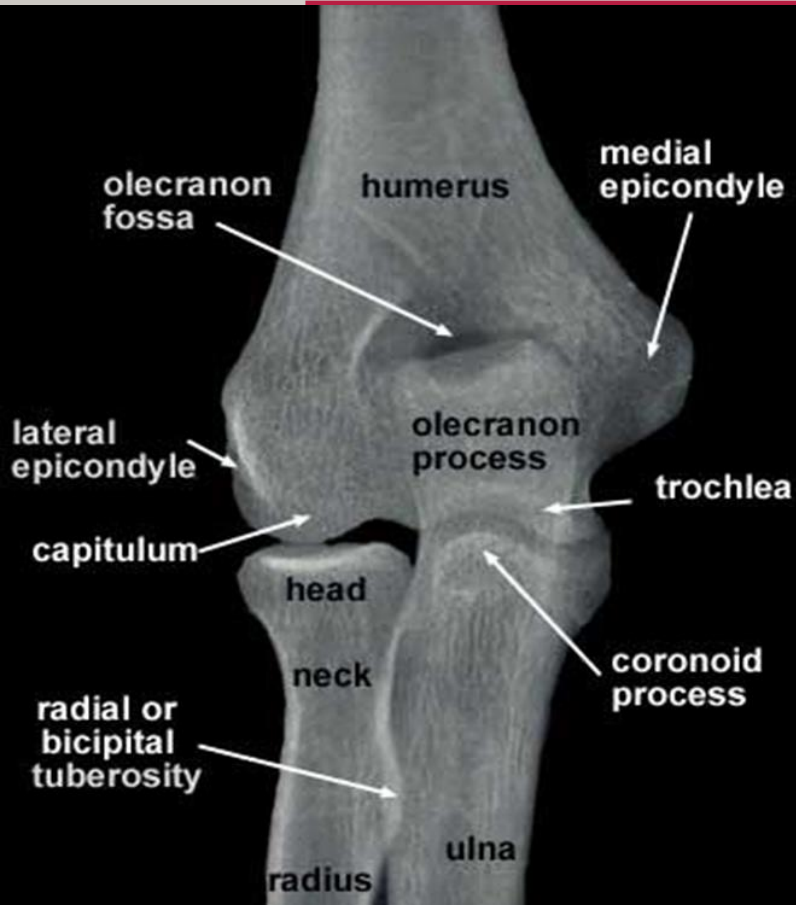
- 4 Forces on the Throwers Elbow
 - Stretch of Medial static / dynamic soft tissue
 - Shearing of Olecranon Tip inside of fossa
 - Compression of Radial Head and Capitellum
 - Traction of Biceps Tendon
- Extension Loss
 - Elbow Flexors vs. Bony Change

SHOULDER

- Internal Rotation or External Rotation Deficits
- 180 Degrees of Motion?
- Weakness proximal can cause a distal problem
- ROM Deficit at Shoulder can be the “cause” of elbow pain



YOU HAVE TO KNOW YOUR ANATOMY...



AND, ITS NOT JUST ABOUT FINDING PATHOLOGY...



- Chronic Evaluations are about finding what you need to “fix”
 - ROM Restrictions
 - Hamstring / Hip Flexor Length
 - Single Sided Rotational Issues
 - FAI / Hip Impingement
 - Mobility / Stability Issues
 - Weakness in the Kinetic Chain
 - Trigger Points
 - Core Stability / Weakness

EVALUATION

- History
- Palpation
- Posture
- Tightness
- Weakness
- Strength Training Regimen
- Mechanics

HISTORY

- “Pop” with one throw?
- Gradual Onset?
- Velocity Drop?
- Activities of Daily Living bother them?
- Numbness or Tingling?
- What makes it feel better?
- What makes it feel worse?
- When does it hurt in the motion?
- Control issues?
- Where does it hurt in the motion?
- “If I warm up for a while...”
- What has their “throwing year” looked like?
- Have they had a consistent build up?

BEWARE OF THE ZEBRA...

- ***“When you hear hoofbeats, think of horses, not zebras”***

- Dr. Theodore Woodward

- **But**, it's also much easier to rule out the big things on the front end than to miss them and have to treat them on the back end...



- Ulnar Nerve Symptoms?
 - **RULE OUT** THORACIC OUTLET SYNDROME
- Lateral Pain with Medial Stress?
 - Refer to **RULE OUT** Olecranon Stress Fracture
- Lateral Epicondylitis / Tennis Elbow Symptoms?
 - **RULE OUT** Posterior Interosseous Nerve or Radial Nerve Entrapment
- Adolescent Athletes with Medial Elbow Pain?
 - Refer to **RULE OUT** Growth Plate Injury

PALPATION

- Differentiate Structures
 - UCL vs. Flexor Pronator Mass
 - Medial Olecranon Tip vs. Triceps Tendon
 - Radial Head vs. Soft Tissue originating on Lateral Epicondyle
- Add “stress/activation” to your palpation

POSTURE

- Rounded Shoulders?
- Head Forward?
- Rib Flare?
- Scapular Positioning?
- Glute Medius Weakness?

TIGHTNESS

ELBOW

- Extension Loss?
- Pronation/Supination ROM Deficits?
- Wrist Flexor/Extensor ROM Deficits?

EVERYTHING ELSE

- Pec Minor?
- Levator Scapulae?
- Posterior Shoulder?
- GIRD?
- Latissimus Dorsi?
- Lack of Shoulder Flexion?
- Thoracic Spine?
- Hips?
- Hamstrings?

WEAKNESS

ELBOW

- Flexor/Pronator Weakness
- Wrist Extensors
- Triceps Weakness
- Grip Strength Weakness

EVERYTHING ELSE

- Posterior Rotator Cuff?
- Middle / Lower Trapezius?
- Core?
- Glute Medius?
- Hip ER?
- Diaphragmatic Breathing?

STRENGTH TRAINING REGIMEN

- Pull vs. Push
- Risk vs. Reward
- Specific Population needs specific exercise
 - Single Sided Restrictions

- A functionally correct move is better than...



- A heavy weighted move that is done incorrectly or puts undue stress on your joints



MECHANICS

- Start from the ground up
 - Throwing across body?
 - Foot strike in relation to hand position?
- Early separation
 - Lets the arm be on time with the body
- Head on line
 - Limit the “Head Snap”
- Let the ball tell you what is happening...
 - Does it run/sink or is it “arm side high”?
 - Does it “cut” or stay on line?

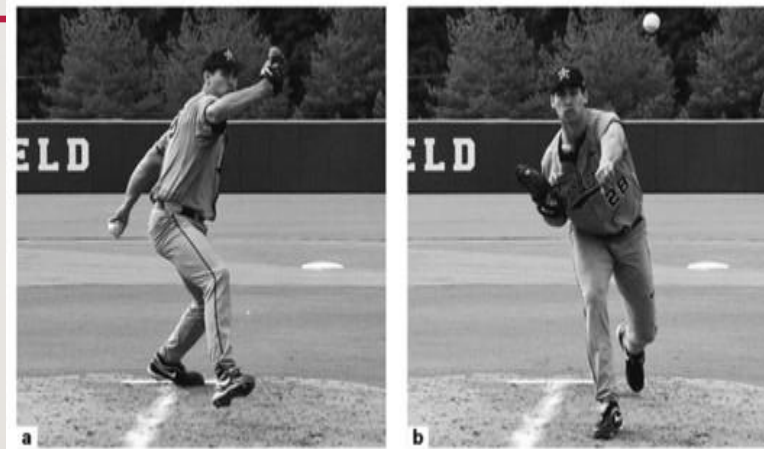
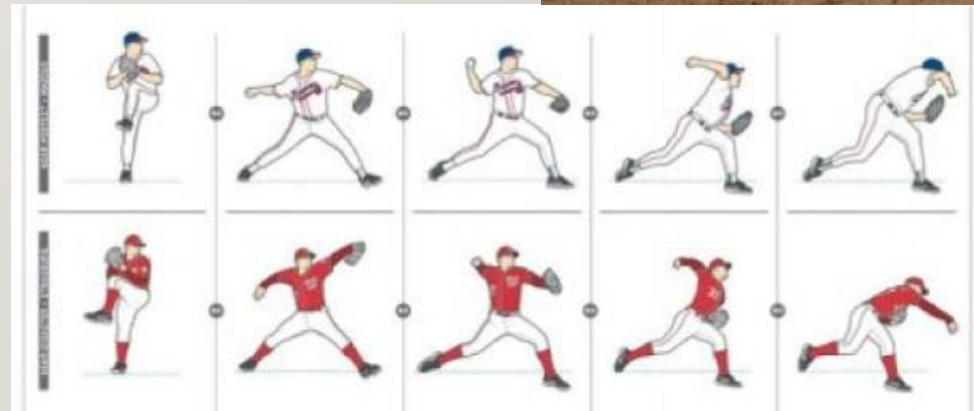


Figure 4.2 This pitcher doesn't initiate his core, and as a result, he throws across his body.



CAN YOU SEE SUBTLE DIFFERENCES?



REHABILITATION

- Addressing Posture
- Soft Tissue Techniques
- Flexibility / Stretching / ROM
- Strengthening
- Plyometrics
- Interval Throwing Programs

ADDRESSING POSTURE

- Scapula Position
 - Fix the Anterior Tilted, Downward Rotated, Protracted, Internally Rotated position
 - Tightness: Pec Minor, Levator Scapulae
 - Weakness: Middle / Lower Trapezius, Serratus Anterior
- Head Forward Position
 - Belly-Shoulders-Chin
 - Double Chin Exercise
- Rib Flare / Chest Breathing
 - “Belly Breathing”
 - “Belly Breathing” with ROM
- Lordosis
 - Pelvic Tilting
 - Hamstring Length
 - Hip Flexor Length

SOFT TISSUE TECHNIQUES

ELBOW

- Graston
 - Biceps
 - Mobile Wad of Three
 - Flexor/Pronator Mass
- Myofascial Gliding
 - Pin and Stretch
 - Mobile Wad of 3
 - Flexor/Pronator Mass

SHOULDER

- Graston
 - Subscapularis
 - Latissimus Dorsi
 - Posterior Rotator Cuff
- Myofascial Gliding
 - Pin and Stretch
 - Teres Minor/Infraspinatus
 - Supraspinatus
 - Latissimus Dorsi
 - Levator Scapulae

FLEXIBILITY / STRETCHING / ROM (AWAY FROM THE ELBOW)

- Thoracic Spine
- Shoulder Flexion
- Diaphragmatic Breathing
- Hamstrings
- Hip / Pelvis / Lumbar Spine
- Hip Flexors
- Piriformis

- Pec Minor
 - Foam Roll
 - Corner Stretch
- Latissimus Dorsi
 - Side lying
 - Release on Foam Roll
 - PNF Patterns
- Levator Scapulae
 - Sitting on Hand
- Posterior Rotator Cuff
 - Sleeper Stretch (Done Correctly)
 - Kimura
 - Sidelying Table Grab with Rotation
 - Cross Body ADD
- Lacrosse Ball Routine
 - Posterior Rotator Cuff
 - Levator Scapulae
 - Pec Minor

BE CAREFUL WITH ANY JOINT MOBILIZATION PRESCRIPTION ON THE THROWING SHOULDER!

FLEXIBILITY / STRETCHING / ROM (SPECIFIC TO THE ELBOW)

POST SURGICAL (*PROTECTED PHASE*)/ACUTE

- ROM lubricates the joint
- Athlete needs to do ROM at home too
- Passive ROM
 - “ratchet” phenomenon
 - Pronation/Supination – Hand Position
- AROM in Brace
- Activation is more important than “stretching”
- Active Wrist Flexion/Extension

POST SURGICAL (*NO LONGER IN PROTECTED PHASE*) / CHRONIC

- Static Stretching
- PNF
- Low Load Long Duration Hangs
- Warm Whirlpool ROM
- Warm Whirlpool / Normatec / Whirlpool Routine
- Radial Head Joint Mobilizations
- Olecranon/Humeral Mobilizations

PRE-REHAB ROM (4.5 WEEKS) / POST WHIRLPOOL ROM / POST REHAB ROM



CORE / PELVIC CONTROL / HIP

- Pelvic Tilting
- Dead Bug / Planks
- Hip ABD / ER

<https://www.youtube.com/watch?v=N0QhWqSW-kc>



SCAPULAR STRENGTHENING

- “Scap Slides”
 - High / Middle / Low
- Manual Patterns
- Rowing
 - High / Middle / Low
 - Prone
- Shoulder Extension
 - Theraband
- Serratus Anterior
 - Push Ups with Pulls
 - Dynamic Hugs
- Swiss Ball
 - Prone Rows
 - Prone ABD
 - Prone Extension
- Sidelying Exercise
 - Shoulder Flexion
 - Shoulder Horizontal ABD

ROTATOR CUFF STRENGTHENING

FREE WEIGHT

- Standing FLEX/SCAP/ABD
- Sidelying ER
- Prone ABD
- Prone Scaption
- Prone Row w/ ER (Advanced)

THERABAND

- IR/ER @ 0 degrees
- Bilateral ER (“No Monies”)
- Bilateral Shoulder Extension
- Bilateral “Y’s”
- Hitch-hikers
- IR/ER @ 90 degrees Flexion
- D1 – D2 Patterns

ELBOW /FOREARM STRENGTHENING

FOREARM

- Wrist Flexion / Extension
 - Concentric before eccentric
 - Eccentric helps prepare for load
- Pronation / Supination
 - Understand where “neutral” is
 - Careful with supination in UCL Reconstruction (no weight supination in protected phase)
- Gripping Exercises
- Diagonal / Dynamic movements
 - Ulnar Deviation
 - Radial Deviation
 - Flexion with Ulnar Deviation
 - “Pitching Grips” with Resistance

ELBOW

- Elbow Flexion / Extension
 - Concentric before Eccentric
 - Protocol dictates decision
 - Endurance → Strength → Power
- Manual Flexion / Extension Patterns
 - Pronation/Flexion : Supination/Extension
 - Supination/Flexion : Pronation/Extension
- Building Triceps Strength
 - Pull Downs
 - Kick Backs
 - OKC vs CKC
 - Triceps bulk like quad bulk in ACL

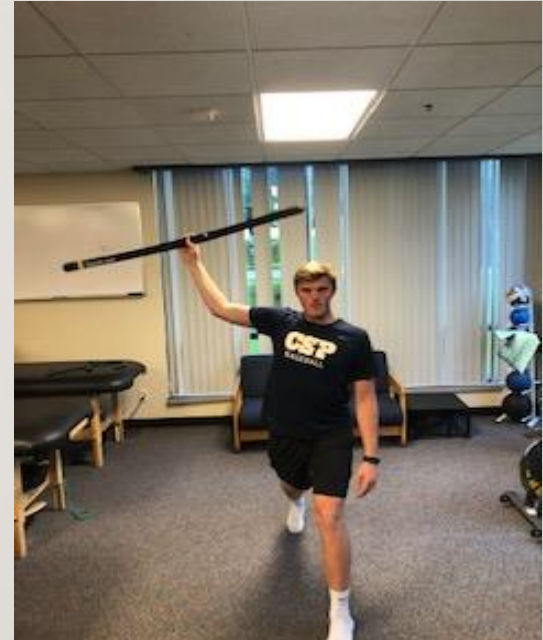


DYNAMIC MOVEMENTS



PROPRIOCEPTION / CO-CONTRACTION

- Table Exercise
 - Perturbation
 - Perturbation through Diagonal Pattern
 - Perturbation at End Range
- Swiss Ball
 - ABC's
 - 90 / 90 Perturbation
- Body Blade
 - Shoulder Flexion/Scaption/ABD
 - Moving ABD
 - Throwing Motion
 - Prone on Swiss Ball



PLYOMETRICS

TWO HAND

- Chest Pass
- Soccer Throw
- “X “ Throws
- Two Hand Dribble
- Hip Rotational Throws
- Sideway-Two Hand Throws

ONE HAND

- Wall Dribble
- IR/ER @ 0
- 90/90 Wall Toss
- Eccentric Catches
- Prone Ball Catches



INTERVAL THROWING PROGRAMS

LONG TOSS PROGRAM

- Use key terms
 - Loose arm action ("like a rope")
 - Throw with an arc
 - No stress
 - "Repeatable motion"
- Make them realize: **it's normal to have a set back**
- Make them realize: soreness at the start that gets better, is fine, **soreness that gets worse, you have to stop**
- Make them realize: **Velocity comes with increased distance**
- Make them realize: **the long toss program is about arm endurance**
- Make them realize: **Can't do anything to accelerate their return, only do things to set it back**

* "WHAT IS YOUR BASELINE?" *

MOUND PROGRAM

- Use key terms
 - Stay over the rubber
 - Early separation
 - Head on line
 - Draw lines to show if they are throwing across their body
 - Use the arm speed they used at 180 ft.
 - **If possible, the pitching coach should be present for all mound work**
- Make them realize: **Use this opportunity to fix a bad mechanic**
- Make them realize: **How your arm feels is more important than how well you throw**
- Make them realize: **Fatigue is real and you have to listen to your arm**
- Make them realize: **Taking a few days off because you are sore is better than having to take 4-6 weeks off because you tried to throw through it**
- Make them realize: **Secondary pitches will come once you have fastball command**

RETURN TO COMPETITION

- What the new baseline of “being back” is...
- The first appearance just begins a new progression
- Long duration between innings will probably affect them
- May have to do things between innings they’ve never had to do before

*** Sit down with your Coaching Staff and come up with the best plan for your athlete to succeed***

QUESTIONS?



GOLDEN BEARS

