Rehabilitation of the Thrower's Shoulder

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No Disclosures

Poor Outcomes

- Rotator cuff repair
  - 8-45%
    - Mazoue: AJSM '06
    - Ide: ASJM '05
    - Payne AJSM '97
    - Tibone: AJSM '86
- SLAP
  - 38-79% of pitchers return, often at lower level
    - Gilliam: AJSM '18
    - Fedoriw: AJSM '14
    - Park: AJSM '13
    - Neuman: AJSM '11
    - Cohen: Sports Health '11
    - Neri: AJSM '11

Why?

Biomechanical Studies Have Shown ER Correlates to Velocity

Werner, AJSM '01; Werner, AJSM '08;
Aguinaldo, AJSM '09; Keller, Ortho '15

Loss of ER is the Kiss of Death in Baseball Pitchers

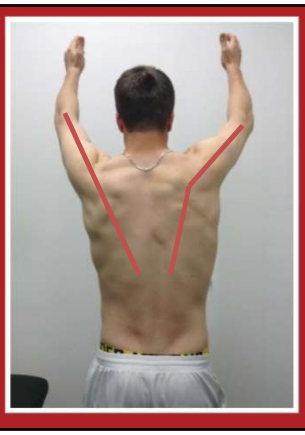
Must Focus on Rehab and Avoid Surgery at All Costs

Throwing a Baseball is Bad for You

Throwing Makes You Tight and Tired

Tight and Tired

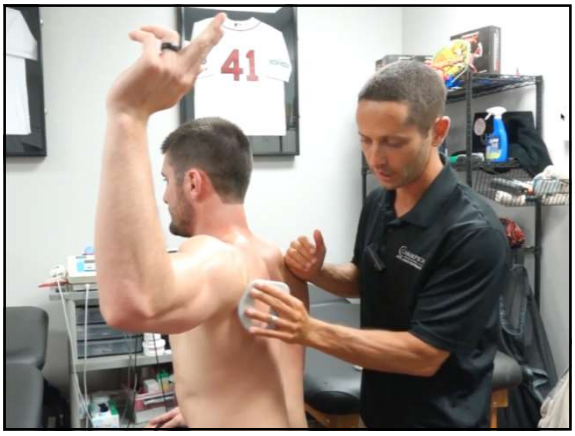
- Immediate loss of IR and Cross Body
  - Reinold: AJSM '09
- Immediate loss of cuff strength by 15-18%
  - Mullaney: AJSM '05
- Cumulative loss of motion and strength if not address
  - Reinold: Sports Health '10
- Correlation between loss of motion and strength to pitching and injury rates
  - McHugh: AJSM '16
  - Tyler: AJSM '14



Rehab The Thrower's Shoulder

- Chronic cumulative stress
- Inherently poor static stability
- Emphasis on dynamic stability

Restore/Maintain Mobility

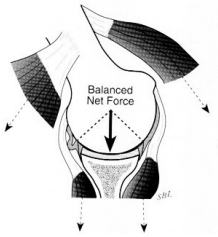


Maintain "You"

Maximize Dynamic Stability

Dynamic Stabilization

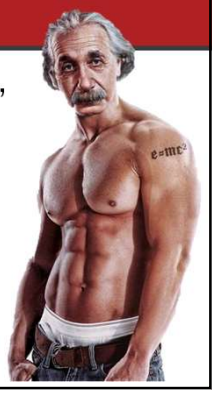
- How do you achieve?
  - Strength?
  - Endurance?
  - Scapula?
  - Posture?
  - Core?



Is Strength Important for Dynamic Stabilization?

Muscle Strength

Is "functional training" enough?



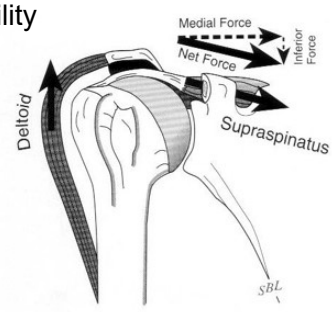
Muscle Strength

A weak muscle
can't stabilize

Effect of Throwing on Strength
Mullany: AJSM '05

Effect of Throwing on Strength
Reinold: Sports Health '10

Just a 3-4% decrease in rotator cuff strength results in potential loss of dynamic stability



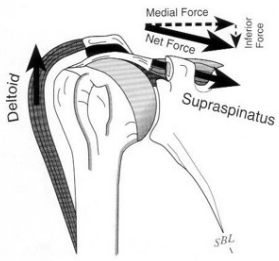
Muscle Strength

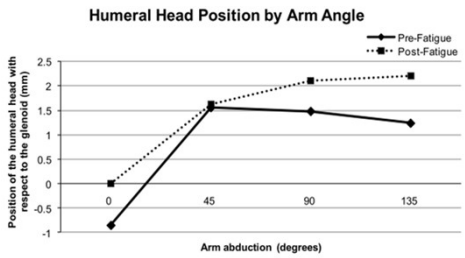
- What is needed while pitching?
- Emphasis on muscle groups that have to decelerate arm and maintain stability
  - Rotator cuff
  - Scapular stabilizers
  - Lower trap
  - Serratus anterior

Is Endurance Important for Dynamic Stabilization?

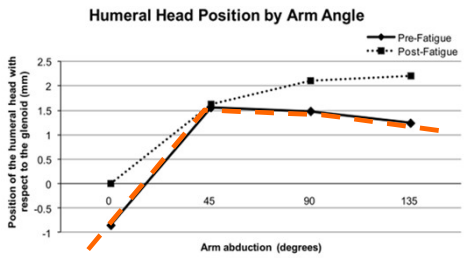
Influence on Dynamic Stabilization

- Muscular weakness & fatigue
  - *Voight: JOSPT '96*
  - *Myers: JAT '99*
  - *Carpenter: AJSM '*





Chopp: JSES '10



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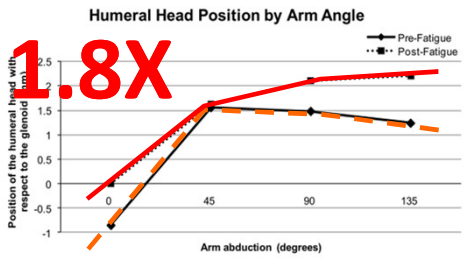

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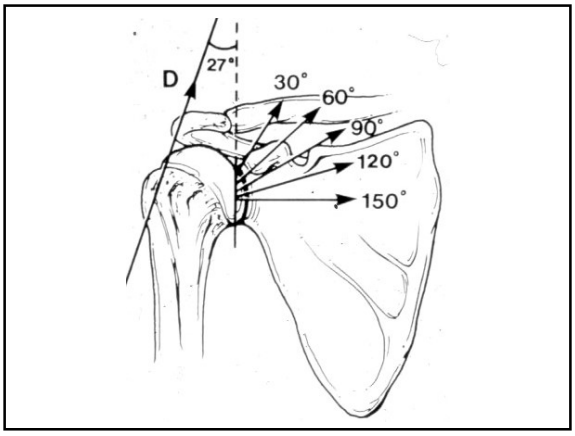
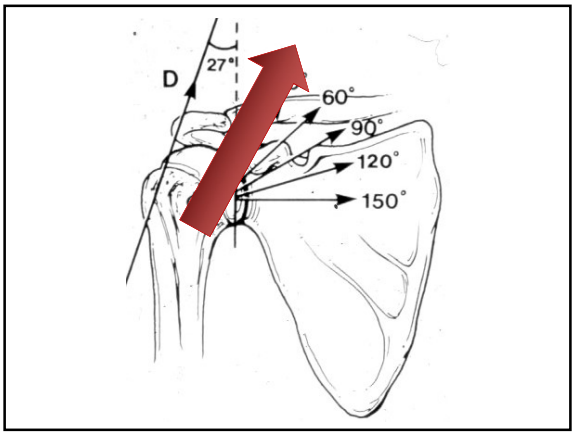




Endurance in Throwers

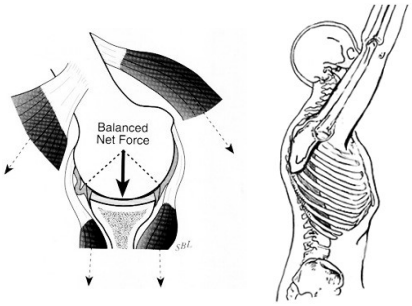
- Avoid working cuff to failure
- Higher reps, lower load
  - Dumbbells
  - Speed Tubing
  - Ball flips
- Minimal breaks between exercises
- Throwing
  - Exercises can compete

Is Posture Important for Dynamic Stabilization?

Influence on Dynamic Stabilization

- Posture
  - Scapula
  - Thoracic Spine
  - Lumbopelvic

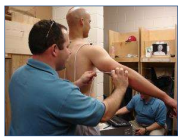
Local and Global Dynamic Stability



Scapular Position

Thigpen / Reinold: APTA '06, '08, '09, '10

- Static resting position of scapula is protracted and anterior tilted
  - Reinold, Wilk, Bastan: APTA '06
  - 71 Professional baseball pitchers
- These positions have strong correlation with decreased serratus and lower trapezius strength
  - Thigpen, Reinold, Gill: APTA '08
  - 50 Professional baseball pitchers



Integration of the Kinetic Chain

Techniques to Enhance Dynamic Stabilization

Dynamic Stability

- Strength
- Endurance
- Posture
- Dynamic stability

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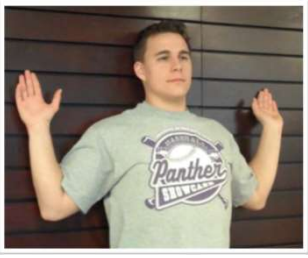

Dynamic Stability

- Strength
- Endurance
- Posture
- Dynamic stability

Key Points

- Return to play after shoulder surgery has poor outcomes
- Avoid at all costs
- Restore mobility
- Maximum dynamic stability

Thank You!

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