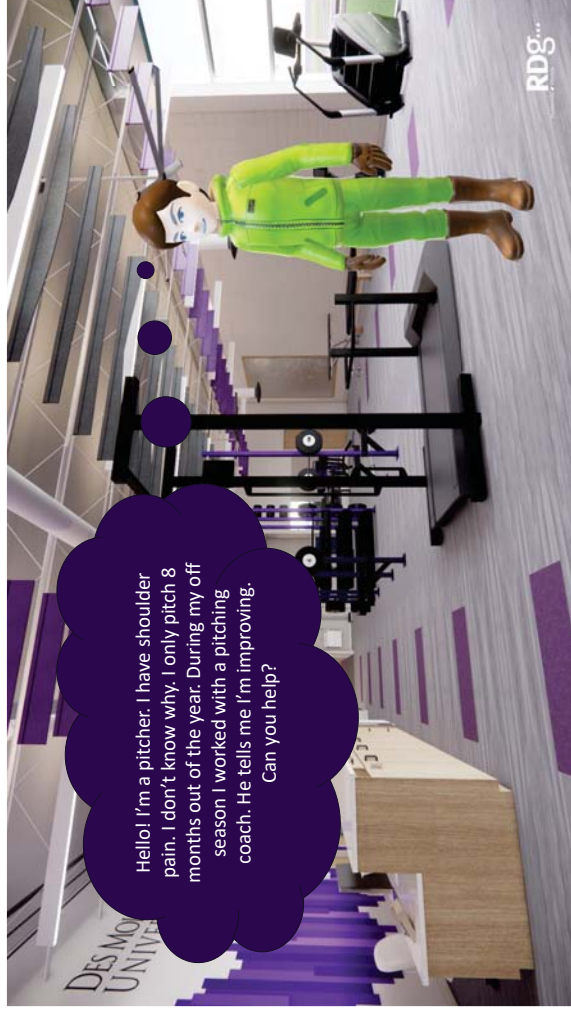


# Rehabilitation of the Overhead Athlete: "Underneath" Factors Relevant to the Overhead Athlete

Lauren Mach, PT, DPT, CMPT, ATC

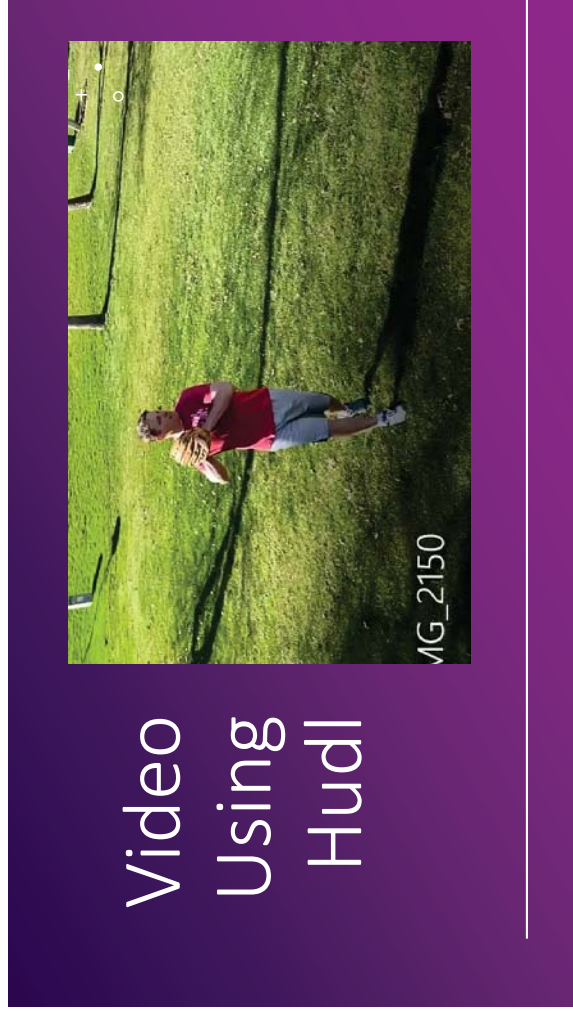


Hello! I'm a pitcher. I have shoulder pain. I don't know why. I only pitch 8 months out of the year. During my off season I worked with a pitching coach. He tells me I'm improving. Can you help?

RDG...



Movement Analysis



## Poll:

Name the Common Mechanical Error “Underneath” that can lead to increased stress at the shoulder and elbow joint. (Seen in the previous video.)

- A. Inadequate glut loading
- B. Early Trunk Rotation or Improper Trunk Rotation Sequencing
- C. Excessive shoulder ER
- D. Knee flexion at initial contact

# WHY?

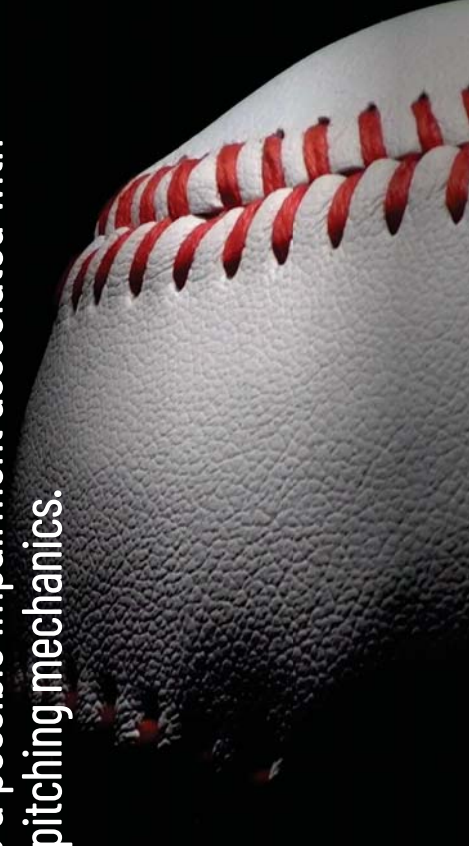
## The Kinetic Chain



A 20% decrease in kinetic energy delivered from the hips and trunk to the arm requires a 34% INCREASE in rotational velocity of the shoulder to impart the same amount of force at the hand.

Kibler and Chandler, 1995  
Seroyer et al, 2010

Name a possible impairment associated with poor pitching mechanics.



## Possible Impairments

Limited Hip Internal /External Rotation

Poor Single Leg Stability

Limited Hip Extension

Poor Lumbopelvic Control

Poor motor planning/ sequencing



## Rehabilitation for the OH Athlete

- Restore Mobility
- Strength and Neuro muscular Control
- Load and Functional Training
- Patient Education

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## Mobility



Robb et al. found that decreased hip ROM in the non-dominant side hip compared with dominant side is highly correlated with shoulder injury and poor throwing mechanics.

Kibler et al. proposed that inadequate hip ROM and poor balance may significantly affect an athlete's ability to transfer energy along the kinetic chain, resulting in dysfunctional movement and increased stresses on the shoulder and elbow

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Manual Therapy

Normatec

Hypervolt

Mobility and the Recovery Zone

Hypershore

Viper

Dry Needling



## Name 1 way to Restore Mobility in the Hip Joint

(Bonus Points if you name an example not given today!)



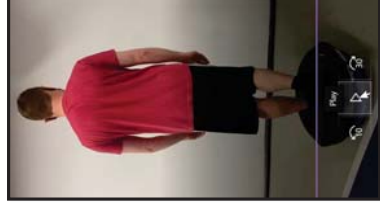
## Neuromuscular Control: Dynamically Stabilize

- Train the body to react to stimulus
  - Efferent Response to Afferent input
- Movement Analysis
  - Lumbo Pelvic Control
    - Single leg Stability / Balance
    - Better Control (2011)
      - Fewer walks
      - Fewer hits
      - Pitching more innings
    - Less Control (2014)
      - Missing > 30 days
      - Missing more days due to injury



Chaundhari et al 2011  
Chaundhari et al 2014

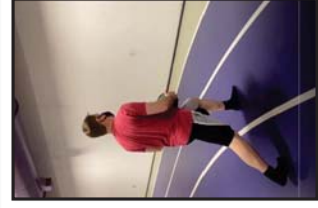
## Strength and Neuromuscular Control



Functional Activity/  
Improve Performance

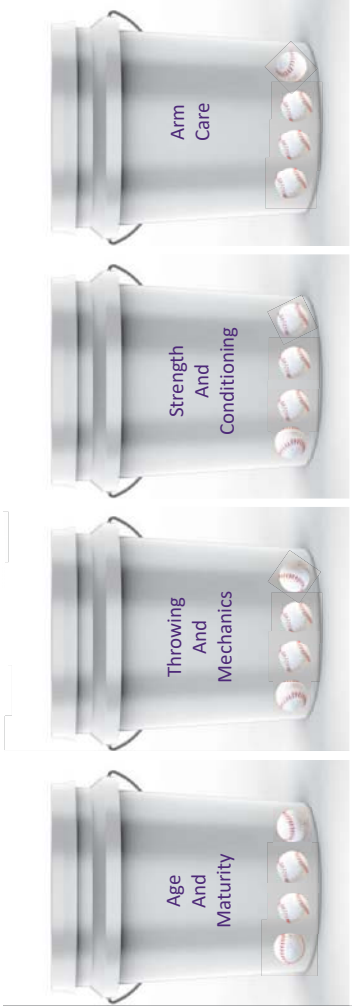


Functional Activity/  
Improve Performance

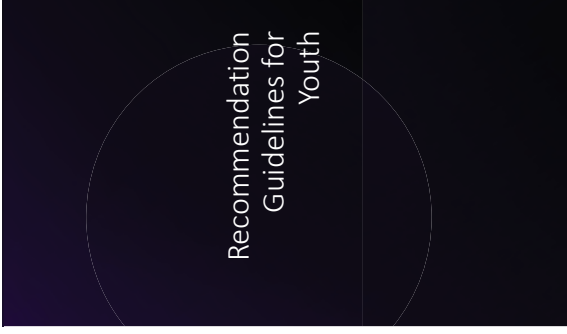


Developing Hip / Shoulder Separation

Developing Linear and Rotation Power



## To Optimize Performance



- 1.) Develop Good Throwing Mechanics as Soon as Possible
- 2.) Do Not Throw With Pain.
- 3.) Avoid Playing Pitcher and Catcher
- 4.) Avoid Using a Radar Gun
- 5.) Follow Pitch Count Recommendations and Rest Days.
- 6.) No Overhead Throwing of Any Kind at Least 2-3 Months Per Year (4 Months Preferred)



- 7) Have Fun! Enjoyment Increases Athleticism and Interest In Sports!
- 8) Participate In An Off-Season Training Program.
- 9) Do Not Pitch More Than 100 Inning Games per Calendar Year.
- 11) Avoid Pitching on Multiple Teams in Overlapping Seasons.
- 12) Stop Throwing if Your Body is Showing Signs of Fatigue
- 13) Learn and Follow Current Recommendations for Maximum Pitch Counts and Weekly Rest Recommendations



## It Takes A Team

- Parents
- Coaches
- Athlete
- MD/DO
- PT
- Strength and Conditioning Specialist
- ATC