

# **UCL Injuries: How Close Can Deceleration Rehabilitation Come to the “Real Thing?”**

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# Statistics

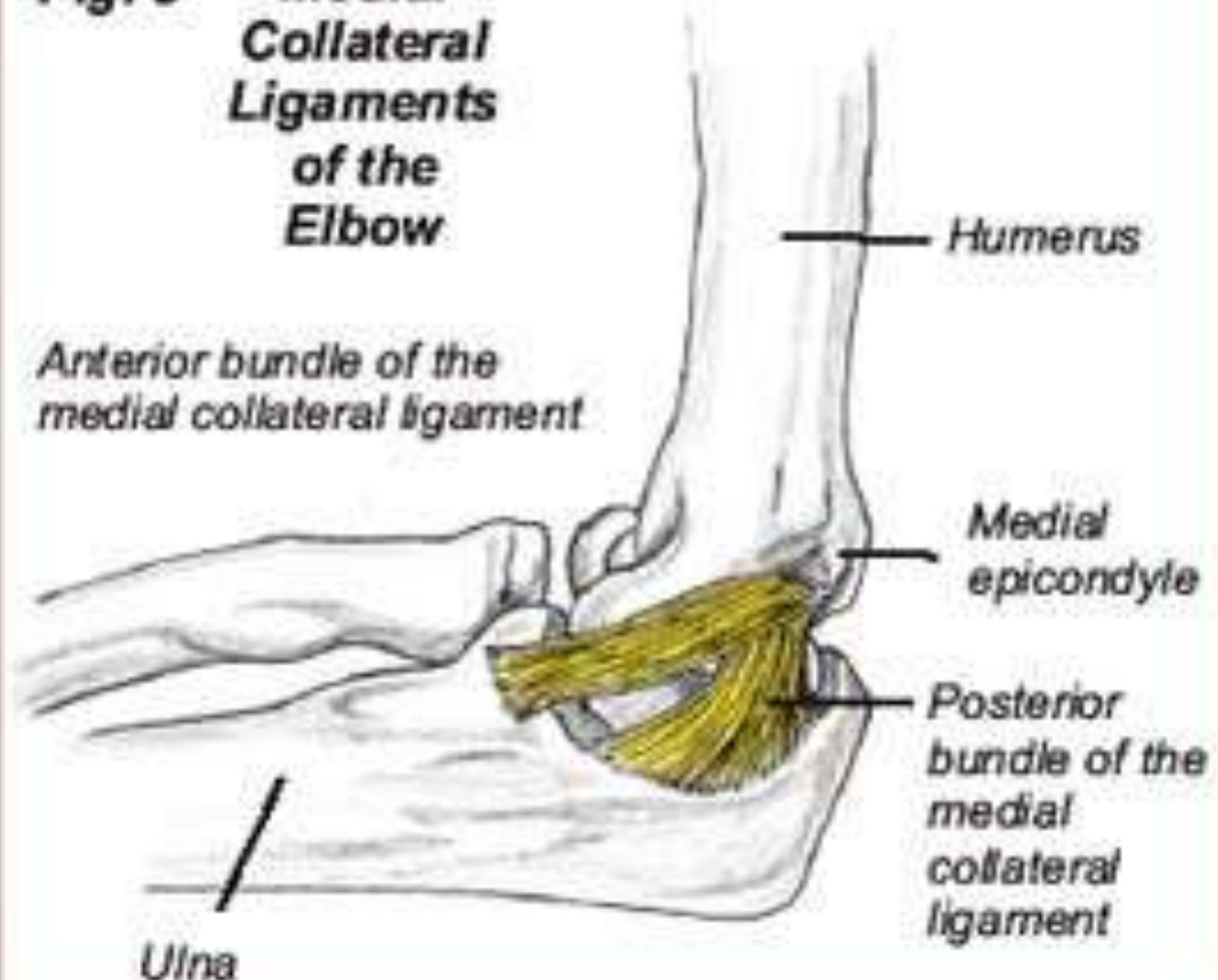
- 85% of professional baseball players return (previously 60%)
- On average, 52% of all players return to play
- 25% of all sport-related injuries are elbow, wrist, or forearm

(Dodd, 2003)

# Medial Elbow Injuries

- Insufficient UCL
  - Insidious or acute
  - Mechanism: excessive valgus stress
  - Pain during early acceleration
  - Maximum velocity will reach 50-60% of norm

**Fig. 3** **Medial Collateral Ligaments of the Elbow**



Humerus

*Anterior bundle of the medial collateral ligament*

Medial epicondyle

*Posterior bundle of the medial collateral ligament*

Ulna

# Statistics

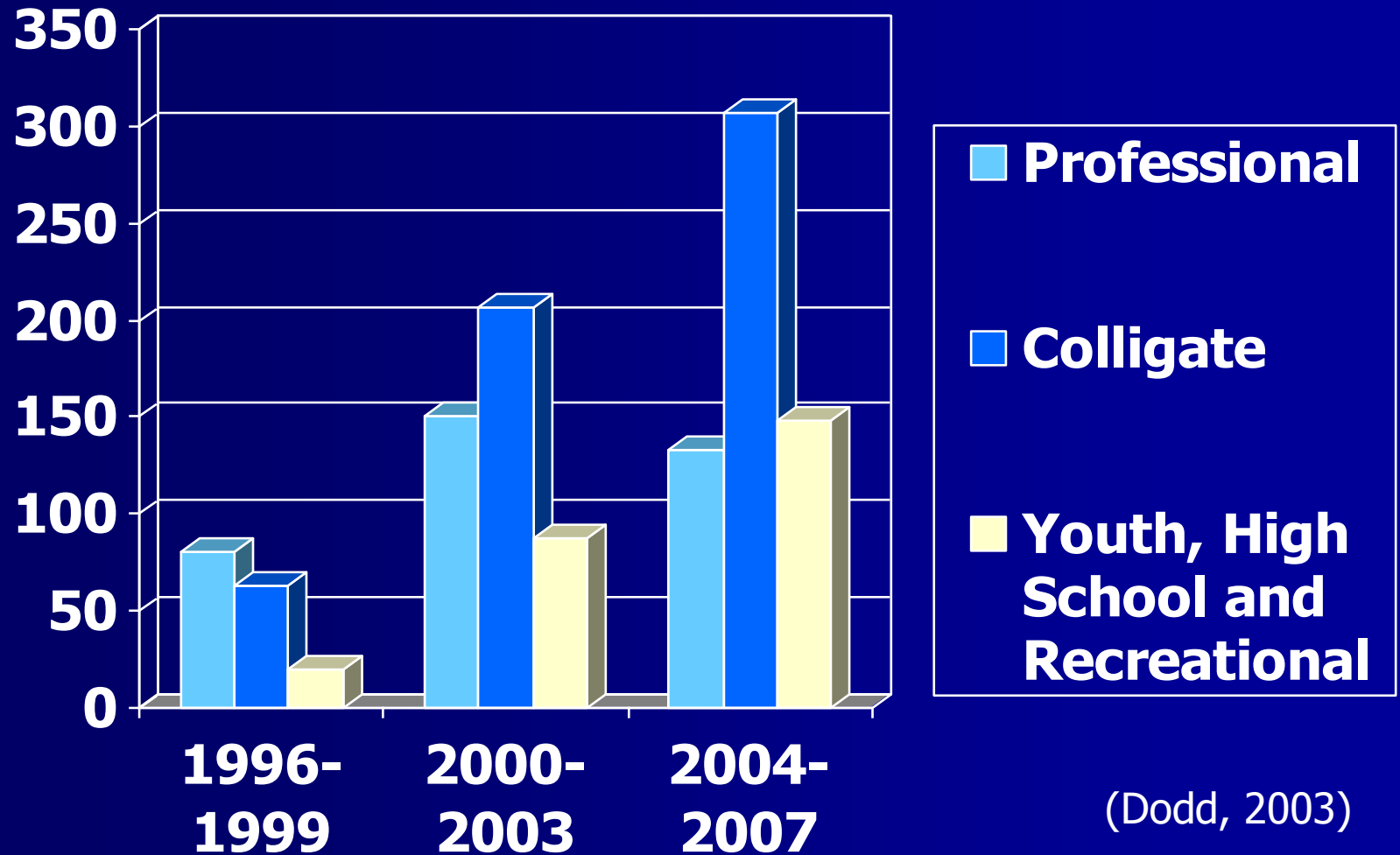
- 1 of every 9 MLB pitchers have had Tommy John Surgery over the past two seasons
- 18-69% of all players report elbow pain
- 17% of Little League players have elbow pain

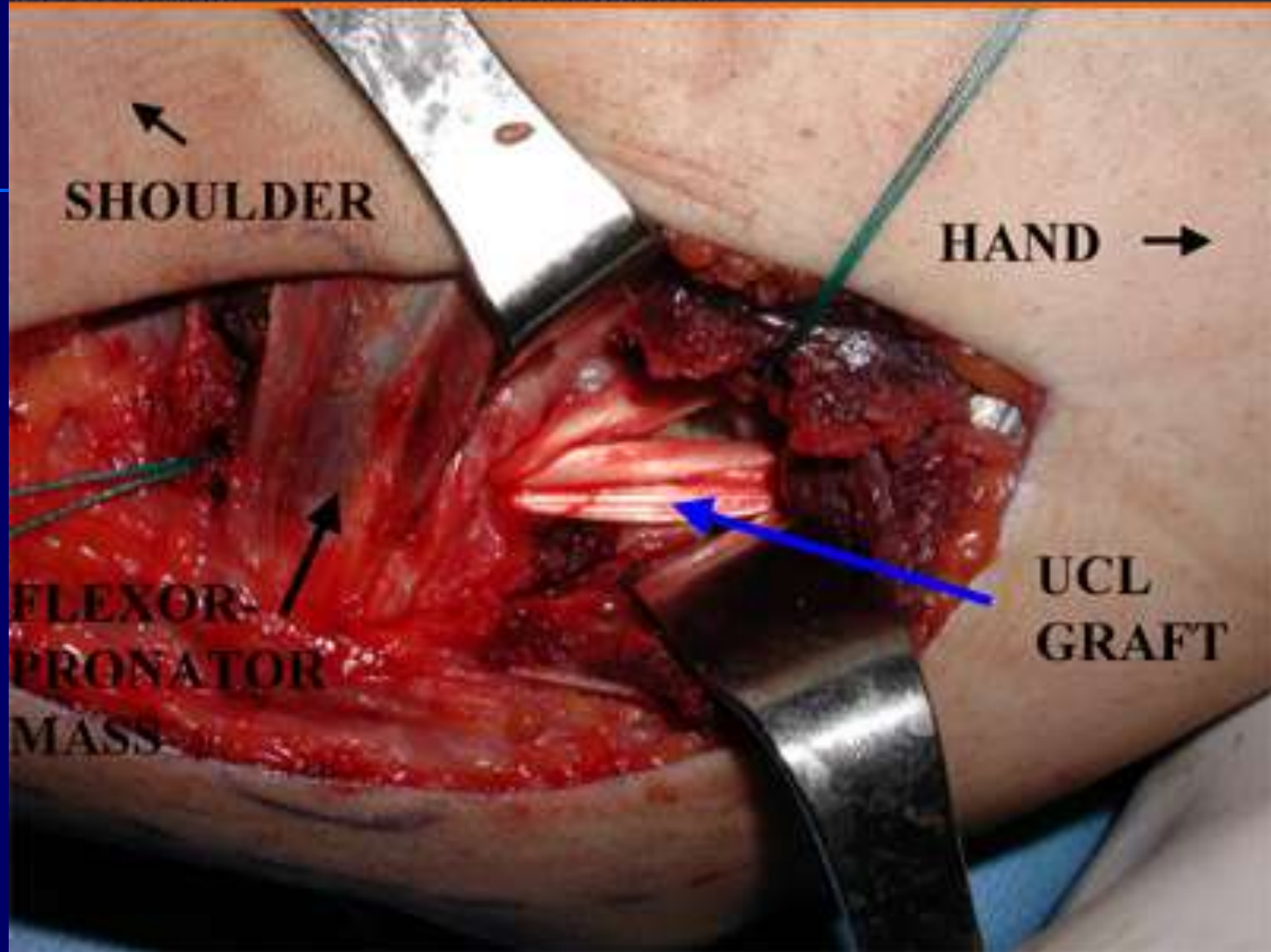
(Dodd, 2003)

# Treatment

- Non-surgical
  - Minimum 6 weeks of rest, stretching and strengthening
  - Gradual return to throwing over several weeks
- Surgical
  - If unable to return to desired level

# Tommy John Surgery by Dr. James R. Andrews





# Expenses

- Cost: \$10,000
- Time off:
  - Medical release in 12-15 months
  - Another year before return to desired level

# Other Studies

- 19 year old colligate pitcher
- 2004: Pain and decreased speed, “worn out”
- 2005: Tight and painful
- Assessments
  - Athletic Trainer: 2<sup>nd</sup> degree UCL sprain
  - 1<sup>st</sup> Doctor: Mild Sprain, No Throwing
  - 2<sup>nd</sup> Doctor: Unremarkable MRI, rehab
  - 3<sup>rd</sup> Doctor: Stress x-ray positive

# Other Studies (cont.)

- 2006: Had Tommy John Surgery, using a Gracilis graft
- Began Rehabilitation the very next day
- Began throwing program 17 weeks post-op
- Released for competitive play at month 11-12

# Purpose of This Study

- To determine the functionality of a rehabilitation exercise with a baseball throw.



# Participant

- One 23 year old male baseball pitcher.
- Experienced Tommy John Surgery in 2005.
- Cleared after 14 months; pitches twice a week; has played for 16 yrs.



# Equipment Used

- 3 Craftsman 1,000 Watt Twin Head Halogen Work Lights
- Panasonic Hi-Definition VHSC Video camera
- Mitsubishi VCR+ with JOG Shuttle

# Activities



**Pitch**

# Activities (cont.)



**Rehab**

# Procedure

- Data collected in batting cage, Sid W. Richardson Center.
- Five trials of each activity were filmed.
- 1 ½ inch zinc oxide tape was used to mark up the wrist, GH-joint, elbow, and the mid-point between the ASIS & PSIS.
- Camera distance:
  - From stationary marker
    - 273 inches
  - From point of stance
    - 164.5 inches

# Procedure (cont.)

- Shutter speed: 1/10000 (30 fps)
- Two global reference markers
- 2' Control object
- Roles:
  - Note taking
  - Filming
  - Supply balls
  - Protecting equipment



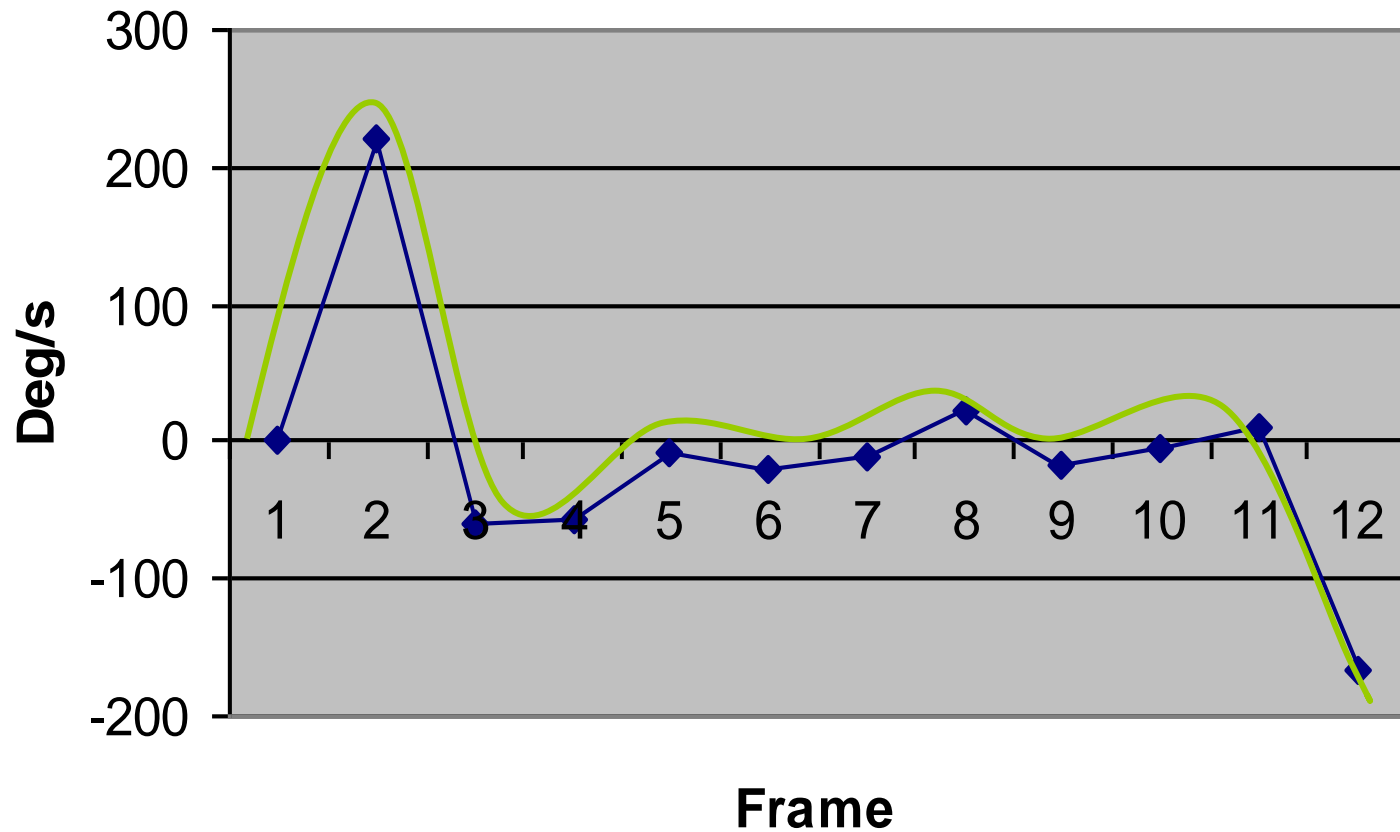
# Data

- Focus on decelerating phase of throw.
- Looking for similar patterns when comparing rehabilitation to actual throw.



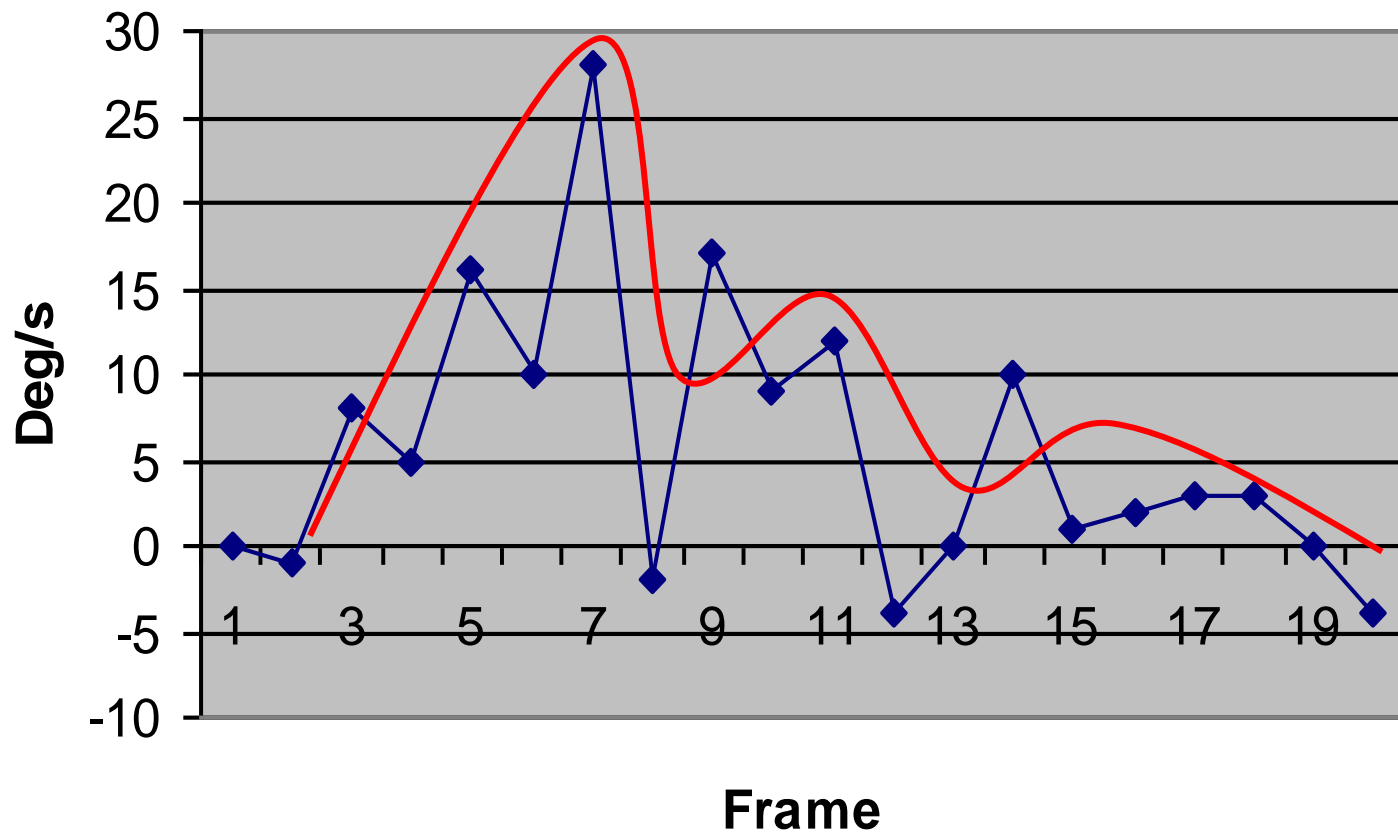
# Light Pitch

## Angular Velocity of Elbow

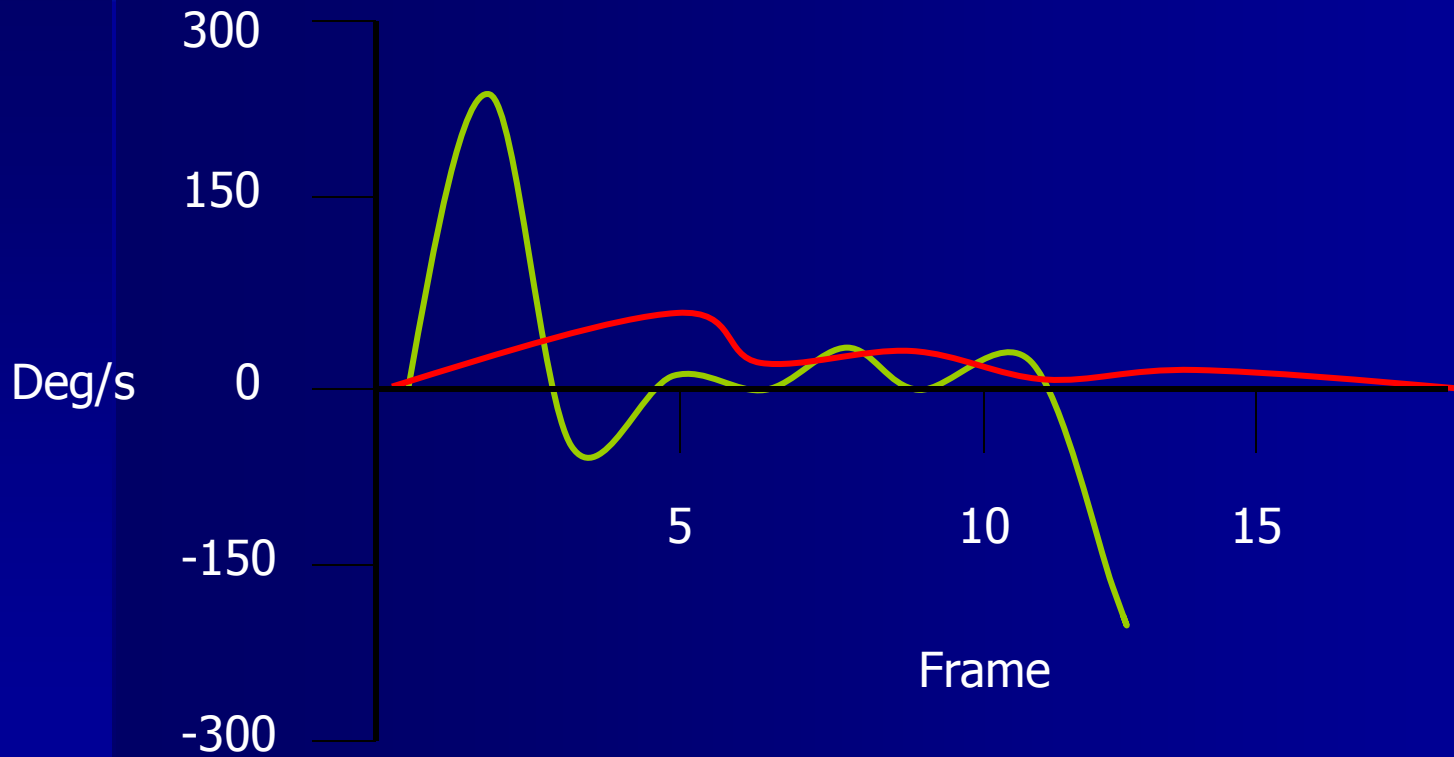


# Rehabilitation

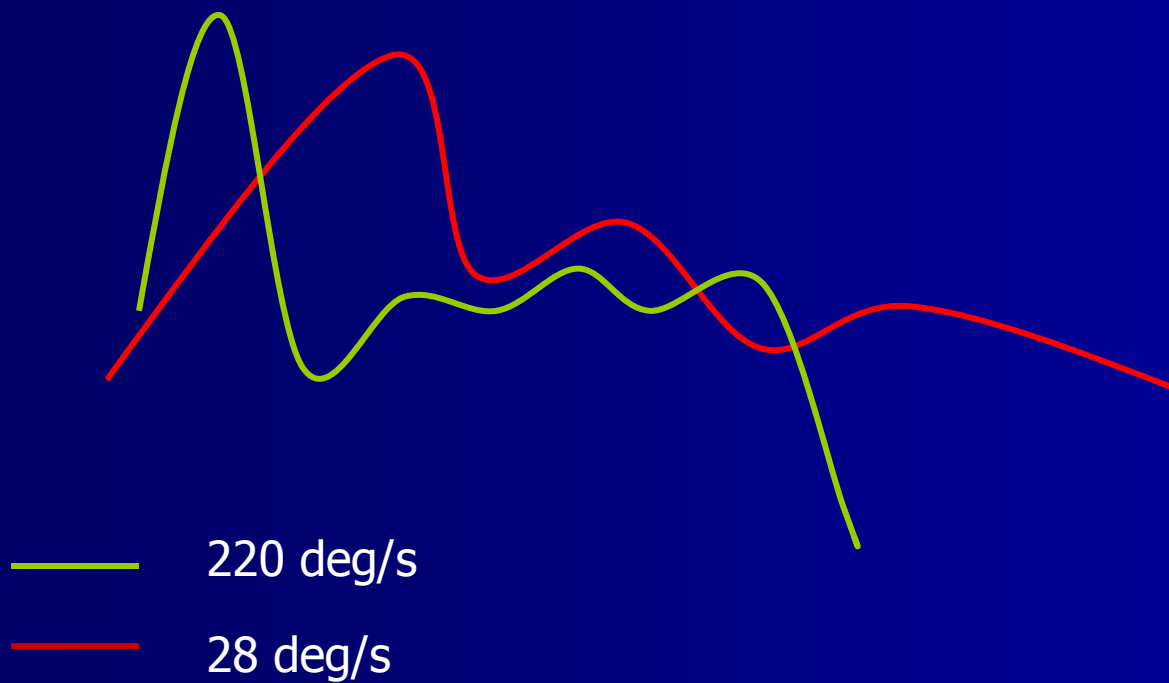
## Angular Velocity of Elbow



# In Contrast



# In Proportion



# Results

- Velocity of actual throw almost 8 times greater than rehabilitation motion.
  - Influencing Factors:
    - Standing vs. sitting
    - Starting position

# Conclusion



# References

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# Thank You



<http://ajhs.schools.sd76.ab.ca>