Baseball Sports Medicine: Game Changing Concepts November 15,16, 2018

FUNCTIONAL ASSESSMENT CRITERIA FOR INITIATION OF THROWING

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DISCLOSURES

- TELADOC

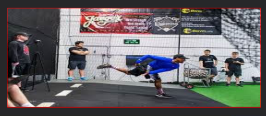
WHEN CAN I THROW?

"When you are pain-free"
"When your ready"
"When you have good dynamic stability"
"When your motion is adequate"
"When you successfully complete rehab program"

"6 weeks"
"4 months"
"When your doctor gives you clearance"

OBJECTIVES

- **OBJECTIVITY**
- **RISK MANAGEMENT**
- **Evidence for Decision Making?**
- **Defining, Measuring, Reporting**
  - VALUABLE PROGNOSTIC INFO
- **OUTCOME DATA!**



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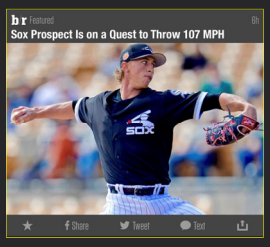
ULTIMATE OBJECTIVE



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YOUTH MOVEMENT

- **Youth Baseball = 17 million plus in US**
- **Lyman et al: *AJSM* '12**
  - 50% reported elbow/shoulder during play ages 9-14
- **Fleisig et al: *J Sports Health* '12**
  - Surgeries in youth baseball players INCREASING

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MAJOR LEAGUE PROBLEM

- **72%** of all DL days due to **SHOULDER / ELBOW**
- **61%** of all DL days are **PITCHERS**
- 1998-2007 – 2:1 shoulder to elbow DL days
- 2007 to present – 1.9:1 elbow to shoulder DL days

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WHERE DO WE START?

- **Limited published literature** for criteria, tests, guidelines for UE injury RTP
- **Minimal tests** with good psychometric properties
- Does **clinical experience/expertise** count?

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ENTER FORWARD THINKERS

- **Wilk** et al: ***JOSPT*** **'93**
  - Correlate between isokinetics/functional testing/function
- **Barber-Westin** et al: ***Arthroscopy*** **'11**
  - Subjective questionnaires/clinical exam/hop tests
- **Myer** et al: ***AJSM*** **'12**
  - No association of time from surgery for ACL deficits
- **Grindem** et al: ***BJSM*** **'16**

  Delaware-Oslo ACL Cohort Study

  STRICT OBJECTIVE CRITERIA LOWERED RISK

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INGREDIENTS

- **Clinical Exam**
  - Sport-specific / non-painful ROM
  - Strength
  - Lumbopelvic component
- **Functional Tests**
  - Measurable / repeatable
- **Subjective Scoring**
  - Psychological readiness
  - TSK 11 / Kerlan-Jobe (Alberta et al. *AJSM* '11)

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PROPER REHAB PROGRESSION

- **Full ROM Achieved**
- **Strength Progressions**
  - Throwers 10, Advanced Throwers 10
  - Adequate dynamic stabilization (end-range stabilization)
  - Plyometric Progression
    - 2 hand, 1 hand throwing

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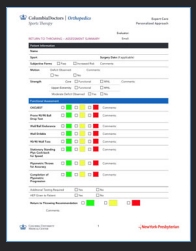
RETURN TO THROWING FORM

COLUMBIA SPORTS THERAPY ASSESSMENT

- **Demographic information**
- **Shoulder Assessment**
- **Elbow/Forearm**
- **Scapular**
- **UE Strength**
- **Core (lumbopelvic) Endurance**
- **Functional Endurance Testing**



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ROM EMPHASIS

- **Wilk et al. *AJSM* 2014 –ROM / Correlate to Elbow Injury**
  - Throwing Shoulder Deficit in TRM 2.3x risk of elbow injury
  - Dominant arm FLEXION LOSS 2.8x risk of elbow injury
- CRUCIAL FINDINGS FOR PREVENTATIVE STRATEGY


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CLINICAL EXAM--ROM

- **Wilk et al: *J Sports Health* '09 ---IR measurements**
- **Wilk et al: *AJSM* '02 ---TROM concepts**
- **Wilk et al: *CORR* '12---ROM Characteristics Pitcher**
- **GOALS**
- **Elbow Full ROM**
- **TROM within 5 deg**
- **GIRD < 15**
- **Horiz Add 40 deg >**

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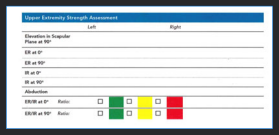
STRENGTH

- **Wilk et al: *AJSM* '93**
- **Wilk et al: *AJSM* '95**
- **GOALS**
- **ER/IR Ratio: 72-76%**
- **ER/ABD Ratio 68-72%**
- **ER: 95% >**
- **IR: 115% >**



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CORE ENDURANCE

- Principles of Stuart McGill / Laudner /Chaudhari
- Hoop Stress
- SINGLE LEG
- GRF CONTROL

[RESEARCH REPORT]

Baseball Players Diagnosed With Ulnar Collateral Ligament Tears Demonstrate Decreased Balance Compared to Healthy Controls

The influence of lumbopelvic control on shoulder and elbow kinetics in elite baseball pitchers

Kevin G. Laudner, PhD, ATC[1,2], Regan Wong, PT, CSCS[3], Keith Meister, MD[3]

Lumbopelvic control and days missed due to injury in professional baseball pitchers

Ajit M.W. Chaudhari, PhD, FACSM[1,2], Christopher S. McKenzie, PT, SCS, ATC[3], Xueliang Pan, PhD[4], and James A. Onate, PhD, FNATA[3]

[1]Department of Orthopaedics, Ohio State University, Columbus, Ohio
[2]School of Health & Rehabilitation Sciences, Ohio State University, Columbus, Ohio
[3]Milwaukee Bucks, Milwaukee, Wisconsin
[4]Department of Bioinformatics, Center for Biostatistics, Ohio State University, Columbus, Ohio

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ENDURANCE TESTING

- Scapular Position---Macrina et al. *APTA CSM* '06
- Proprioception decrease –Carpenter *AJSM* '98
- Mechanics / performance decrease—Murray *AJSM* '01
- Humeral Head Migration—Wickiewicz *JSES* '91
- **INJURY** (Little League Pitchers)---Lyman *AJSM* '02

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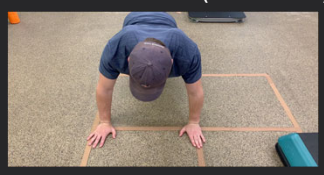
FUNCTIONAL TESTING

- CKCUEST
- # of Touches in 15 seconds
- <21 increased likelihood for injury (Pontillo 2013)
- Compare to Normative Values (Pontillo 2011)



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PRONE 90-90 DROP TEST

- 30 second test
- Compare Dom / NDOM
- Goal >90%-110%

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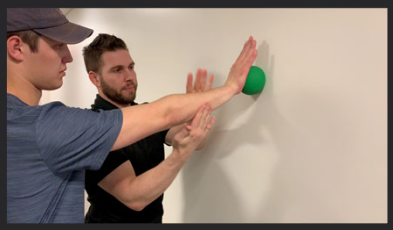
WALL PERTURBATION

- 45 seconds x 3 rounds
- No Pain, NC with fatigue



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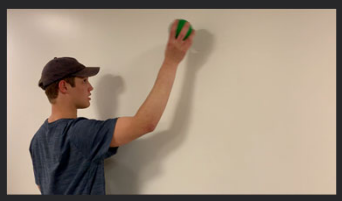
WALL DRIBBLE

- 2 lb plyo ball
- 15 reps x 3 bouts (1 rep = 12 to 3 o clock, 3 to 12 o clock)
- No pain
- NC with fatigue



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90-90 WALL TAPS

- 2 lb MB
- 25 reps x 6 rounds
- No Pain, NC with Fatigue

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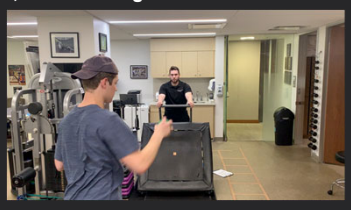
PLYO 90/90 TOSS

- 1 lb MB
- 25 reps x 4 rounds
- No Pain, NC with Fatigue



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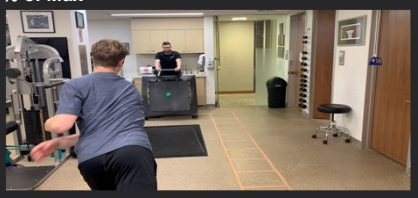
90/90 ACCURACY TOSS

- 1 lb MB
- 25 reps x 2 rounds
- 75% of Max



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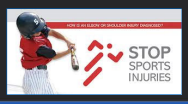
SUMMARY

- **SERVES AS A CONTINUUM**
  - Parallel to Recovery, Rehabilitation
- **RISK TOLERANCE FRAMEWORK**
  - Biopsychosocial model (INDIVIDUAL FACTORS)
- **RESEARCH EVIDENCE IN CLINICAL PRACTICE SCARCE!**
- **STANDARDIZED APPROACH**



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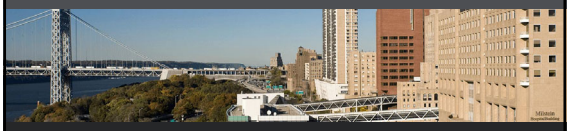
THANK YOU



AMAZING THINGS ARE HAPPENING HERE

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