

Baseball Sports Medicine: Game Changing Concepts November 17,18, 2017

CORE MUSCLE AND OBLIQUE INJURY PREVENTION




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DISCLOSURES



- TELADOC





OBJECTIVES

- Defining the Problem
- Challenging Current Thought
- Endurance vs. Strength
 - BIG 3
 - Framework for Athletes




ULTIMATE OBJECTIVE



Four images of baseball players in action: a batter swinging, a pitcher in mid-throw, a catcher in a crouch, and another pitcher in mid-throw.

BASEBALLS CONUNDRUM


April 2010—4 players DL oblique injuries in MLB
April 2011—14 players DL
1991-2010 --- Oblique 5% of all baseball injuries
2010—Pitcher DL avg. 43 days, Position player 31 days



Two images: Stonehenge on the left and the 'Stranger Things' logo on the right.

Camp, Conte, Dines 2017

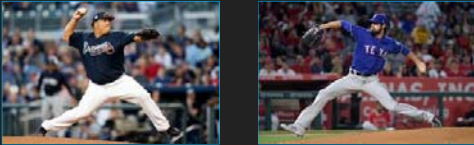
- 5 seasons (2011-2015) HITS DATABASE
- 996 total injuries (MLB 26%, MiLB 74%)
- **22.2 days missed per injury**
- Better with injection? 32.3 days
- No injection 21.3 days return
- Cortisone: 29 days to return
- PRP 40.3 days
- **2016 data—MLB increase**



An image of a doctor in a white coat shrugging his shoulders with a confused expression.

DEMOGRAPHICS

- Higher in Hitters (56%) Pitchers (44%)
- 77% Contralateral side (Pitchers AND Hitters)
- Majority of Injuries in **EARLY SEASON**



Note: The image shows two baseball players in mid-pitching motion. The player on the left is wearing a dark jersey with 'Astros' on it, and the player on the right is wearing a blue jersey with 'TEX' on it.

BIGGER STRONGER FASTER



Note: The collage includes a pitcher in a Detroit Red Wings jersey, a batter in a white jersey with number 99, and a player in a red jersey holding a bat. There are also several text boxes with statistics and facts, though they are small and difficult to read.

MUSCLE = STIFF SPRING

Sacrifice?
MOTOR CONTROL




Note: The collage includes a cartoon of a person at a gym with a speech bubble saying 'Like turtles to the sloughs, my dear.' and three photos of Tiger Woods from different years: March 2014, August 2014, and February 2015. There are also two photos of Tiger Woods in a red shirt and a black shirt.

VELOCITY (YIELDING)

Modulating influence of velocity

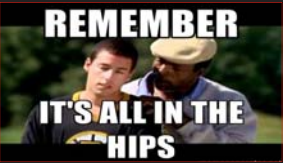
- **Synchrony of muscle firing!!!**
- Positions the joint(s) to modulate stiffness
 - CRUCIAL FOR END RANGE POSITIONING
- Hoffer (1981) – Modest Activity to achieve **STABILITY**



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CHUBBS WAS RIGHT!



HIGH RISK when force developed in the spine!
KINETIC CHAIN LINKING
Baseball swing starts in LE (Shaffer et. al 93)
LE to UE energy transfer at ball contact (Welch et al. 95)



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FINE LINE

Rehabilitation vs. Athletic Performance
Zatsiorsky 1995 – “strength / speed training”
Chaudhari et al 2014
Lumbopelvic control / Pitching performance



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COMPRESSION

Perturbed Motor Patterns
"Attack Angle"



NIOSH/NIOSH/NIOSH

QUANTIFIABLE EFFICACY

NIOSH


3300N



NIOSH/NIOSH/NIOSH

EVOLUTION OF STABILITY

Lucas / Bresler 1961– Osteoligamentous spine
Balanced Stiffness – McGill 2002
Pillar Strength – Verstegan 2004 – incorporate UE / LE



NIOSH/NIOSH/NIOSH

STRENGTH VS. ENDURANCE

Biering-Sorenson 1984
Strength cannot predict future low back pain
Endurance reduces risk!


Low continuous force is the.....



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BLUEPRINT

Create basic **understanding**



Repetition


Progress to **functional / sport specific** movements

Breathing Patterns (high level motor control)

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CAUTION!

3300N **6000N**




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BIG 3
"Hoop Stress"
Symmetrical Stiffness – McGill 2002
Rectus – Paraspinals -- Obliques




McGill University

FUNDAMENTALS
Gain lumbopelvic control
Groove motor patterns through repetition
DECREASE SPINAL LOAD
50% MVC RECTUS



McGill University

BALANCE LATERAL TORSO
2500 N



McGill University


UNDERSTANDING HOLD TIMES

8 SEC



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PARASPINALS



27% Lumbar
45% Thoracic
3000 N

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HIP HINGE



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