FLORIDA CHIROPRACTIC ASSOCIATION

# DNS & THE ROTATIONAL ATHLETE

**Brett Winchester DC**

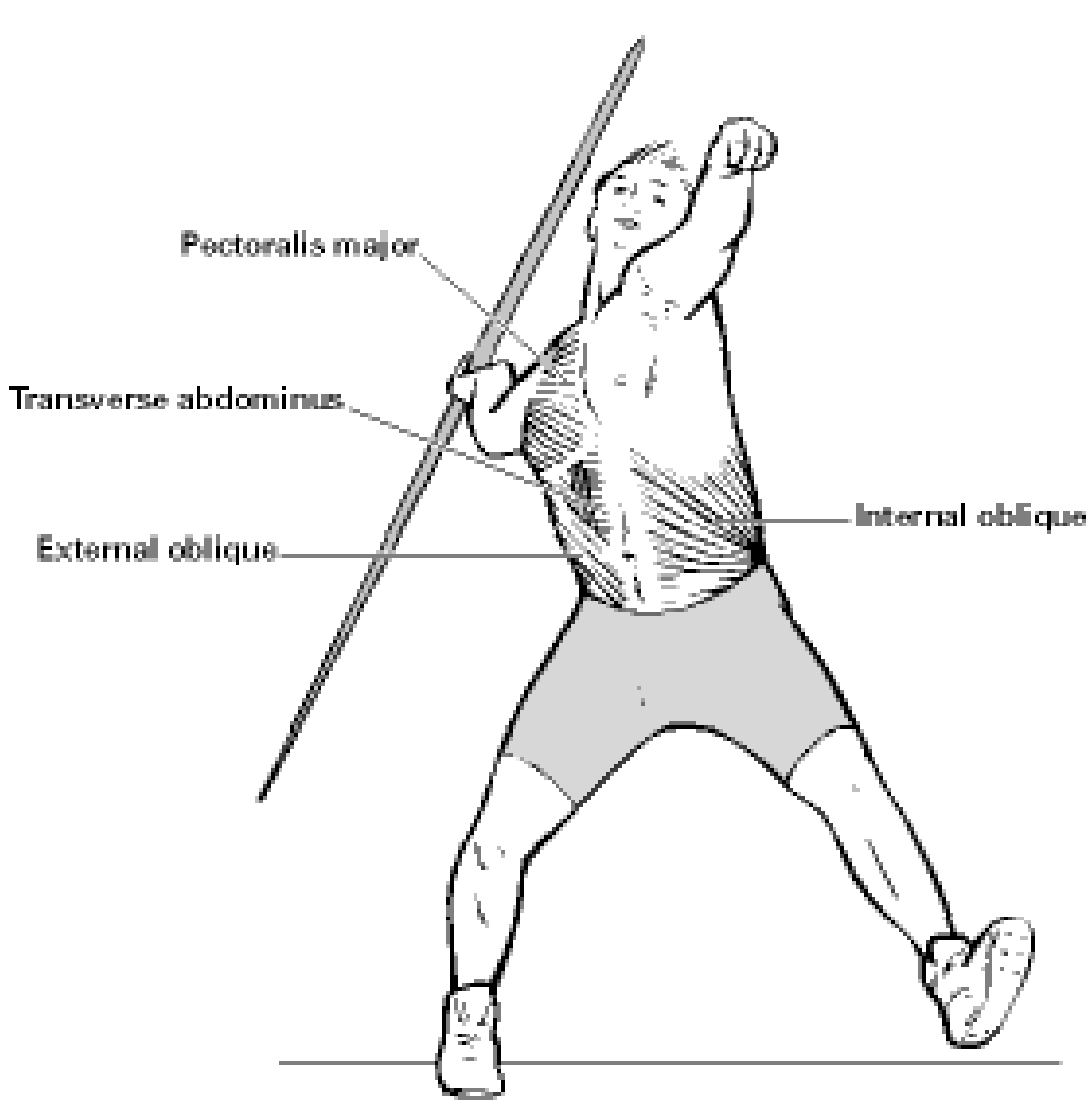
**November 18-19, 2022**

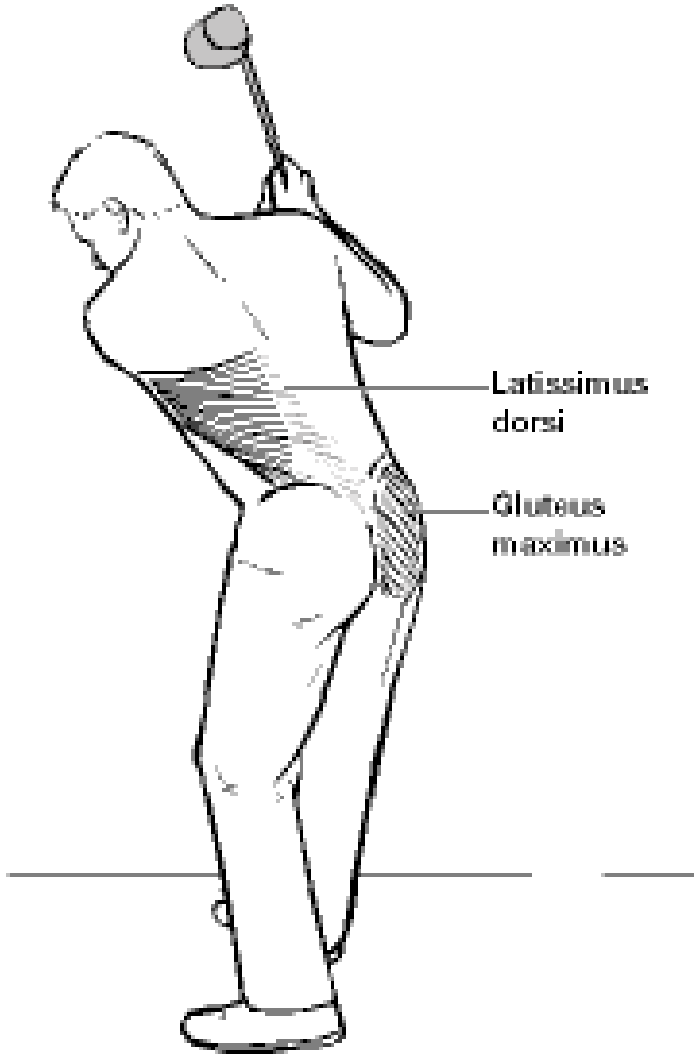
**Naples, FL**

# THE ROTATIONAL ATHLETE

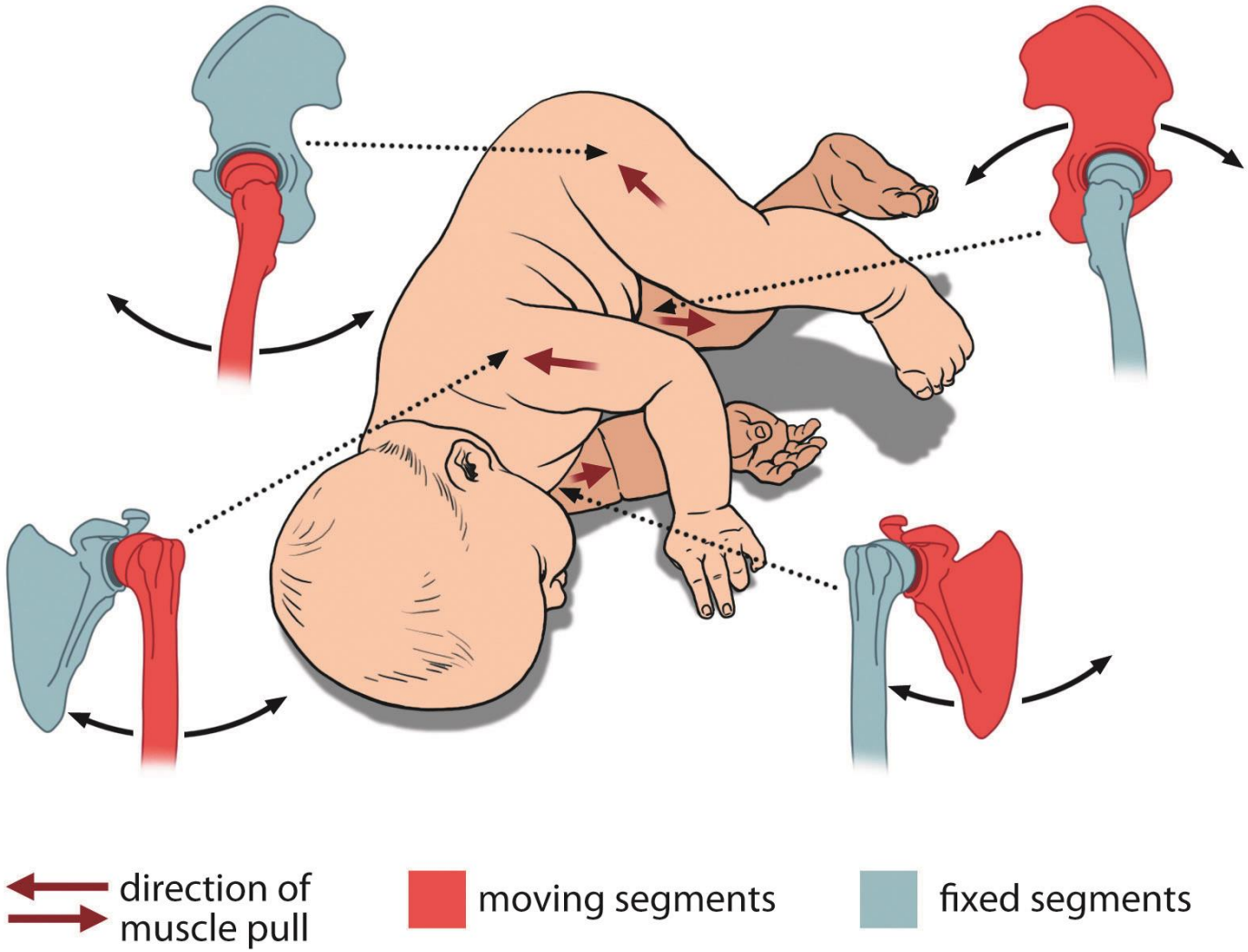
- **IPSILATERAL PATTERN**
- **CONTEMPORARY ABDOMINAL WALL FUNCTION**
- **KINETIC CHAIN**
- **JOINT DISSOCIATION**
- **ASSESSMENT AND TREATMENT**

# IPSILATERAL PATTERN


Pectoralis major
Transverse abdominus
External oblique
Internal oblique


Latissimus dorsi
Gluteus maximus

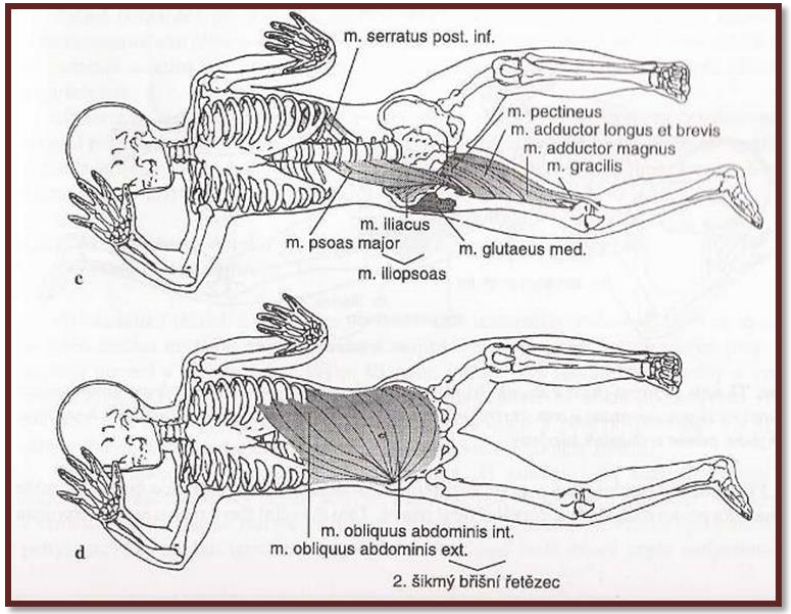
# IPSILATERAL PATTERN

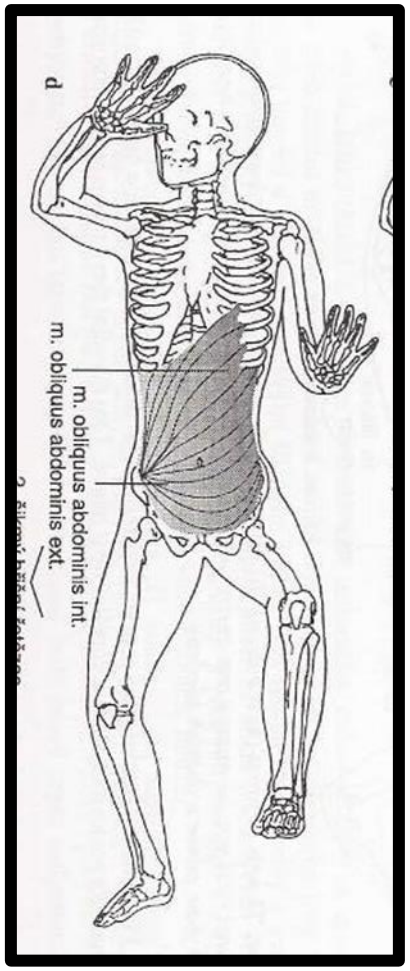


MIA

NYY 0 ARZ 0 ▼1ST 2 OUT 1-2 FOX

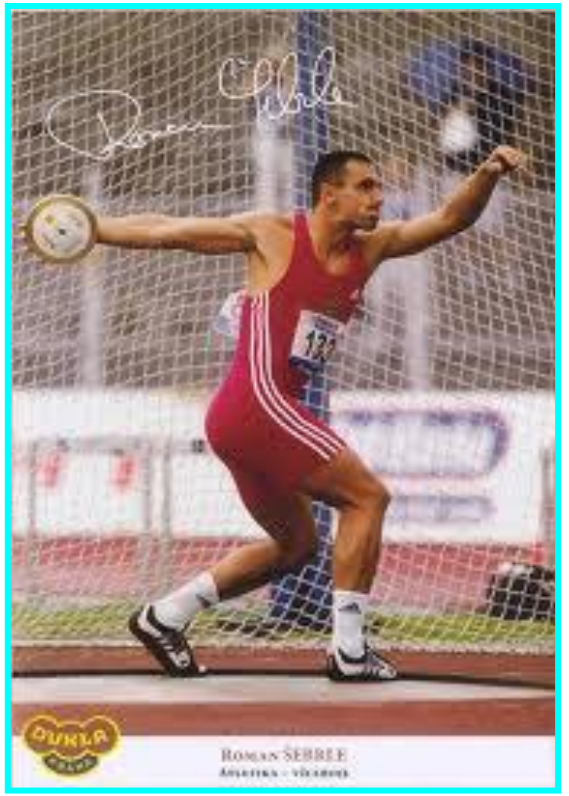
# “ENERGY SYSTEM THROWING”



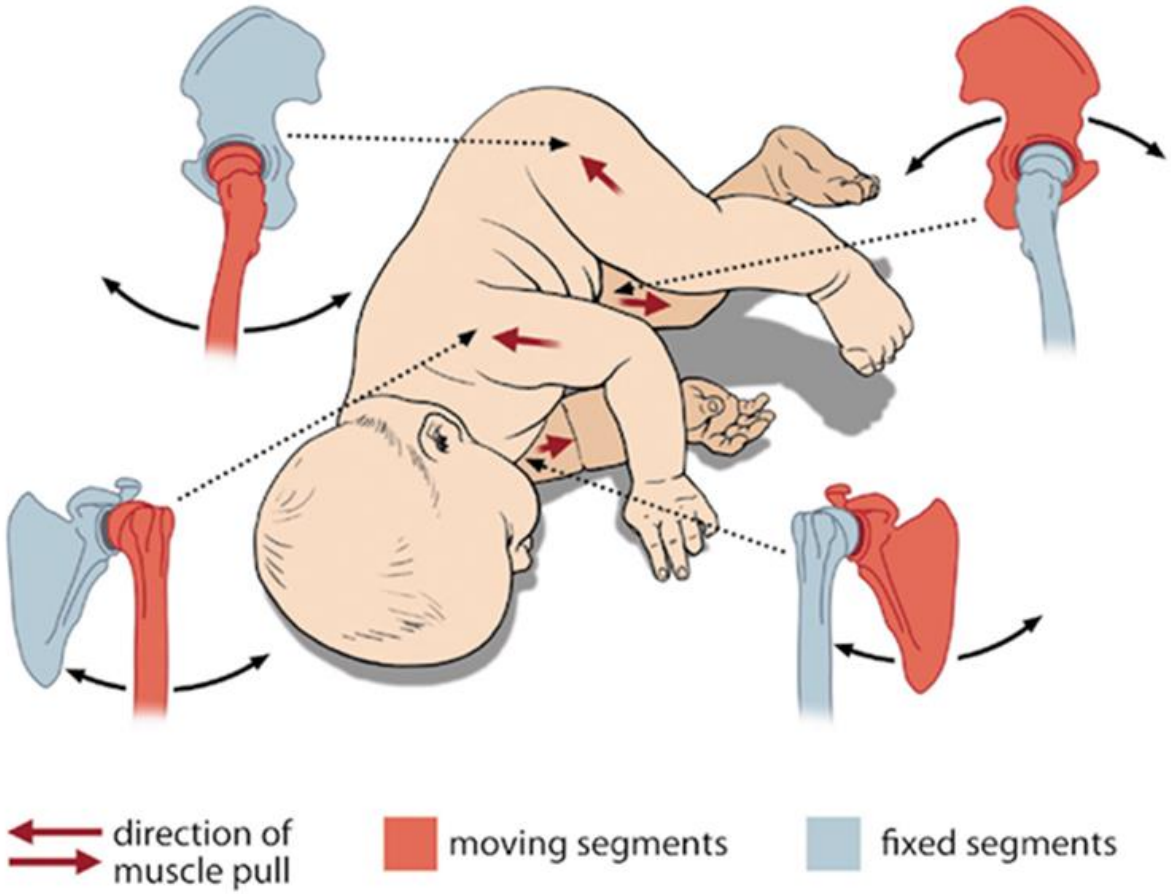



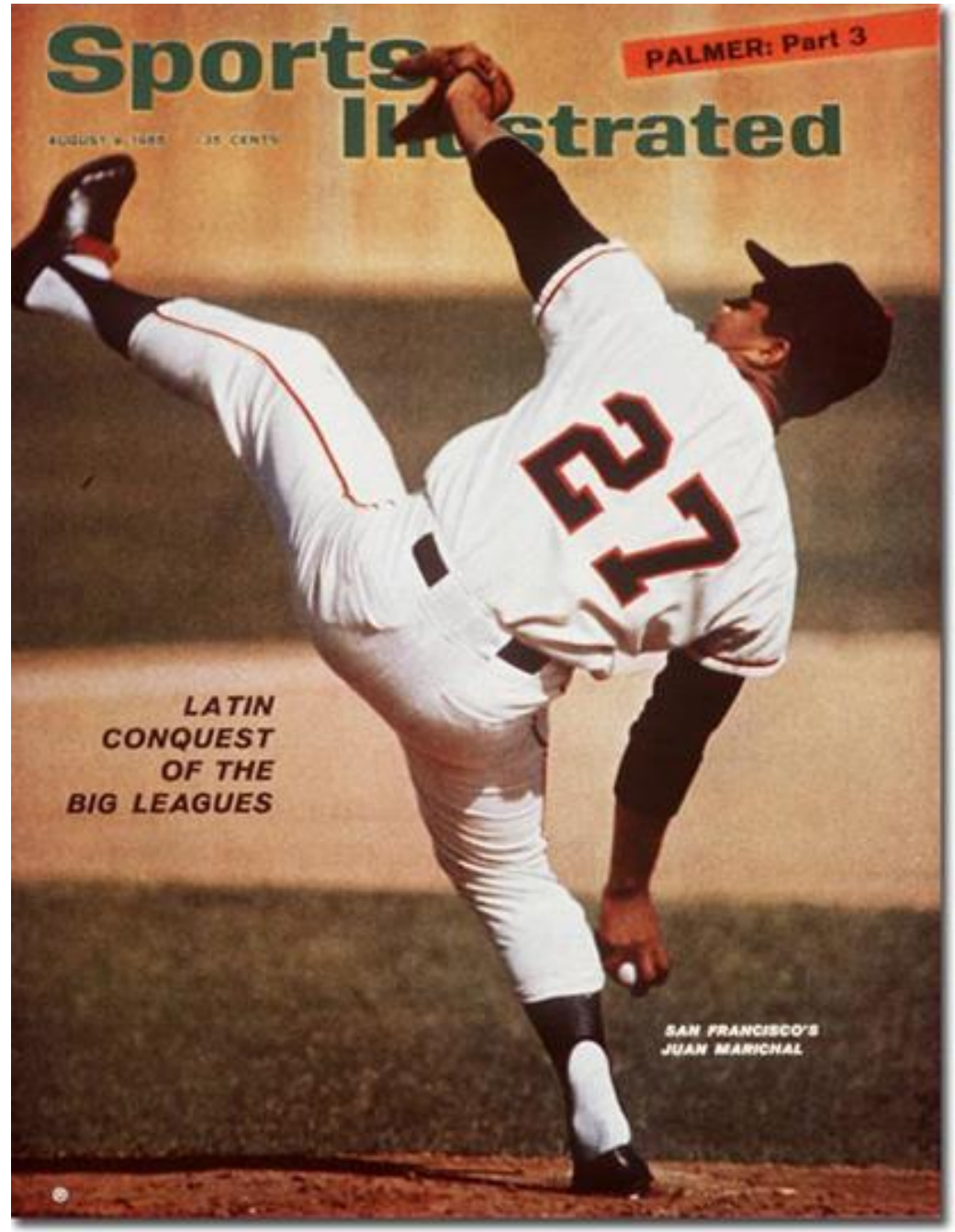
# IPSILATERAL PATTERNS

- Throwing
- Ground strokes
- Golf swing
- Kicking



# Ipsilateral pattern/shoulder & pelvic axis
# ALWAYS PARALEL

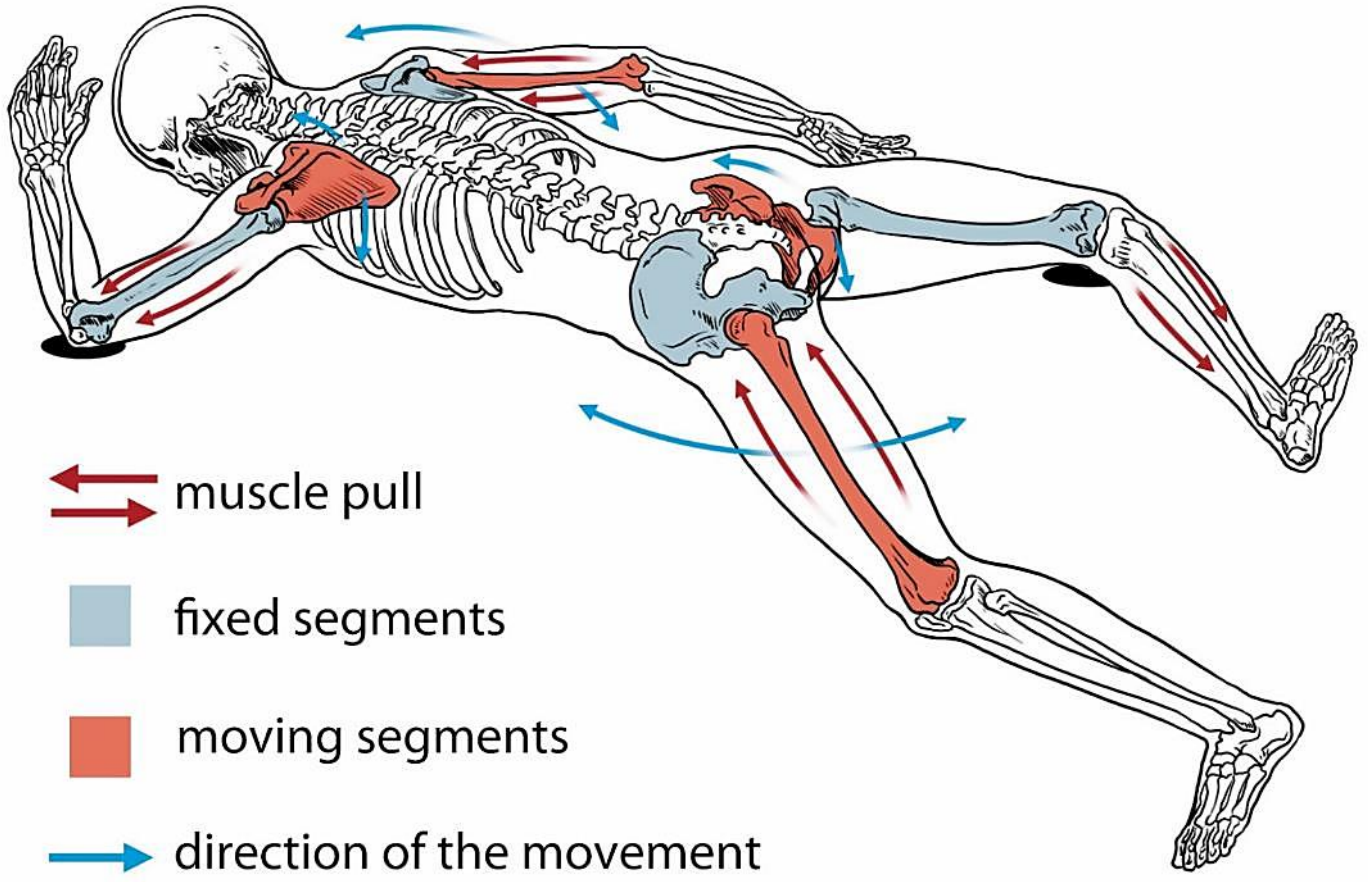

direction of muscle pull
moving segments
fixed segments


Sports Illustrated
PALMER: Part 3
LATIN CONQUEST OF THE BIG LEAGUES
SAN FRANCISCO'S JUAN MARICHAL
27

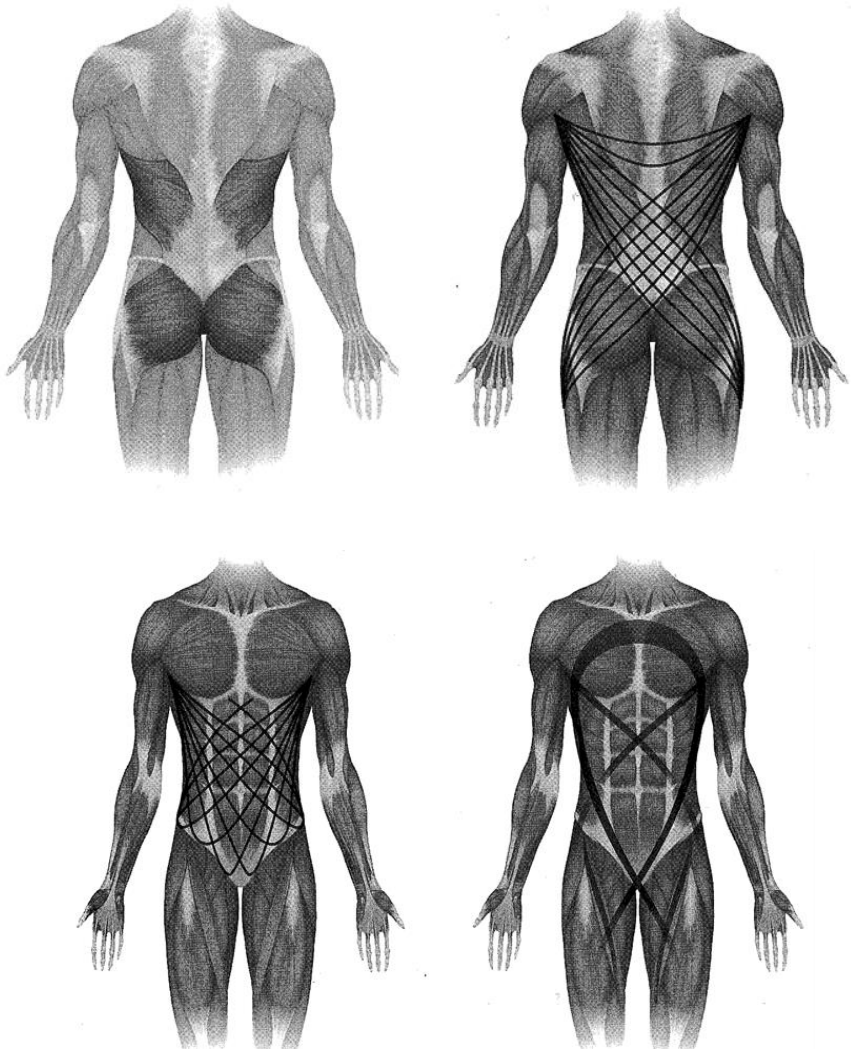
# IPSILATERAL PATTERN

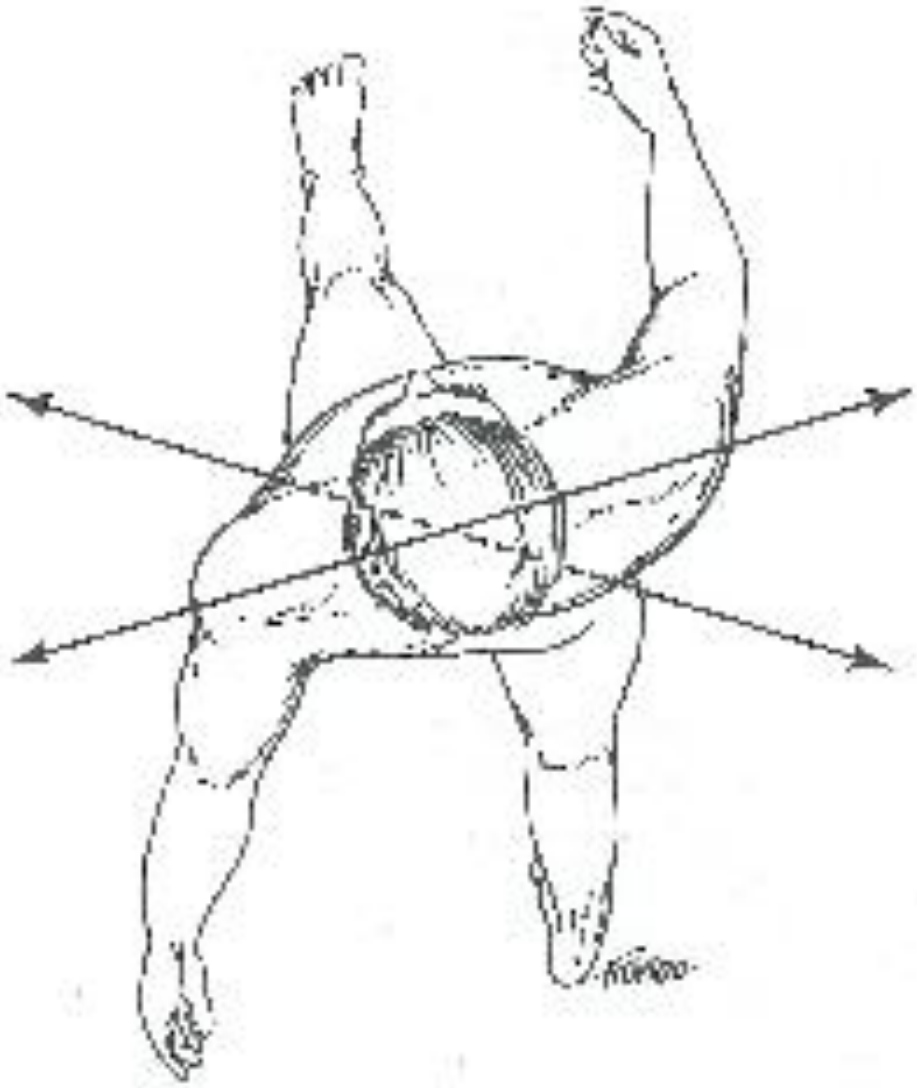
shoulders
hips

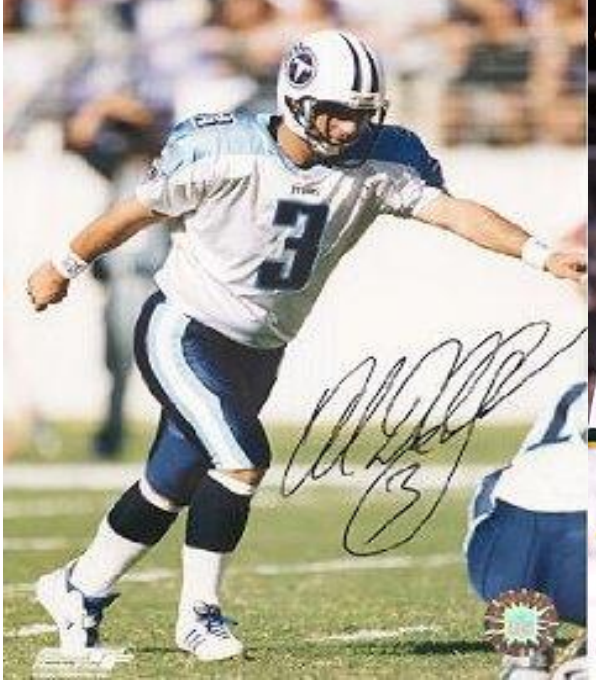
# CONTRALATERAL PATTERN



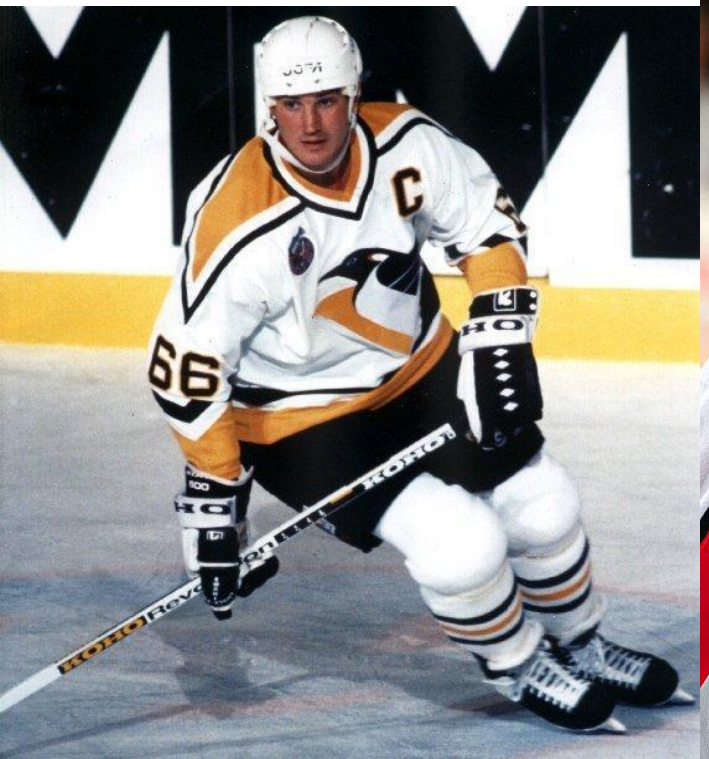
# CONTRALATERAL PATTERN

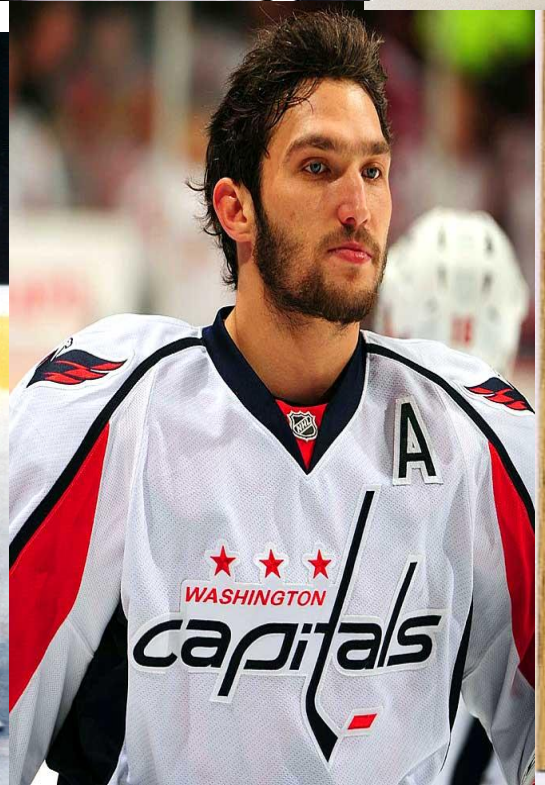


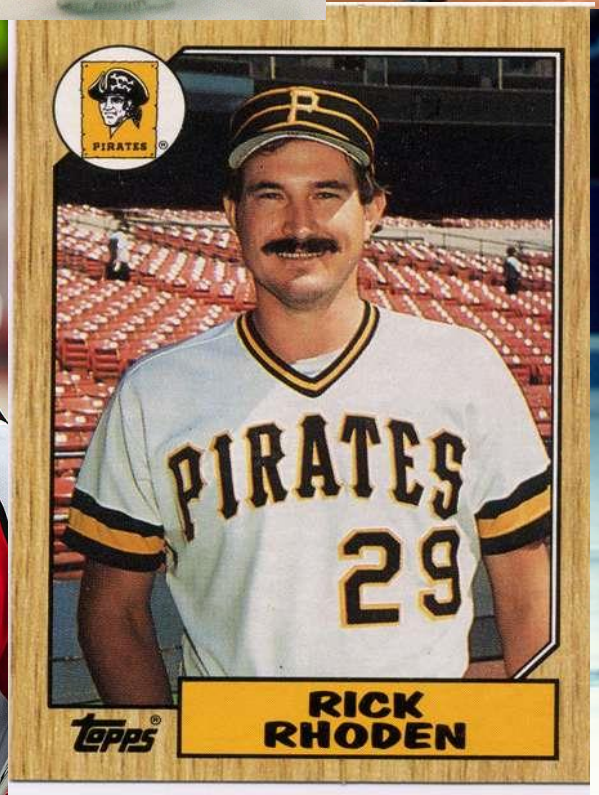




DALLAS
STARS

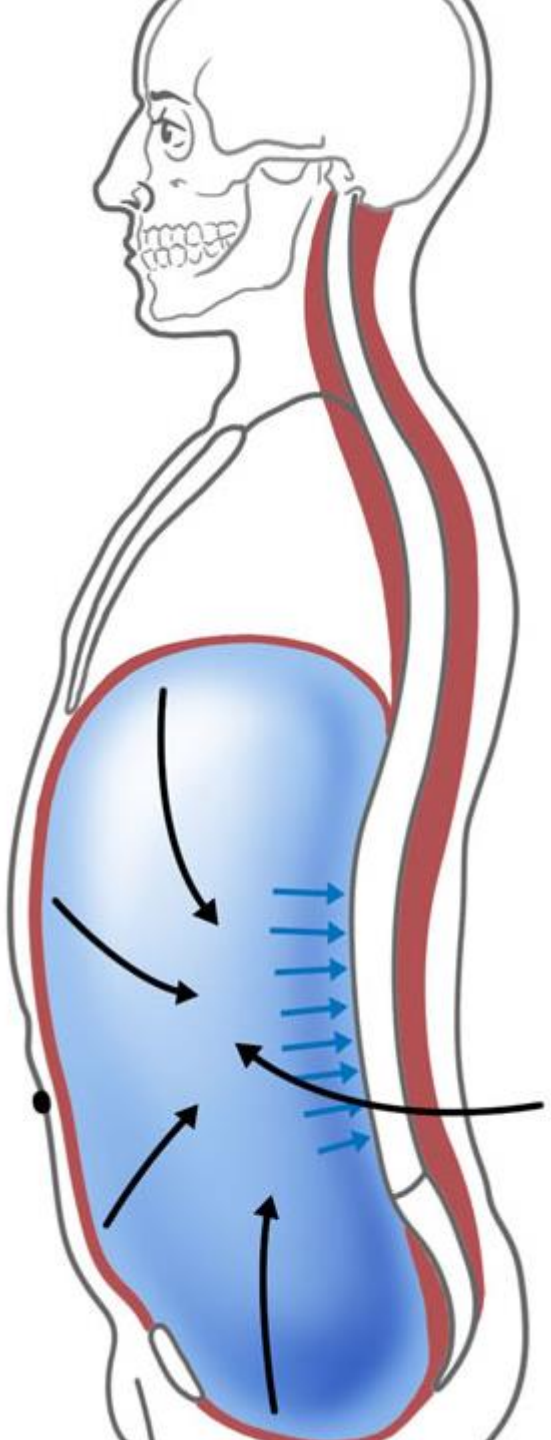


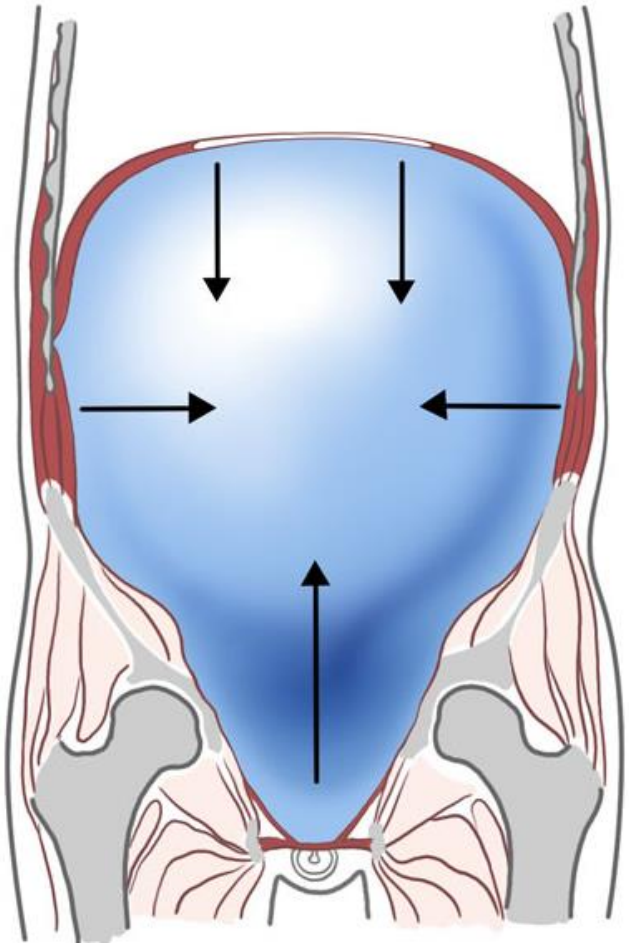

WASHINGTON
capitals

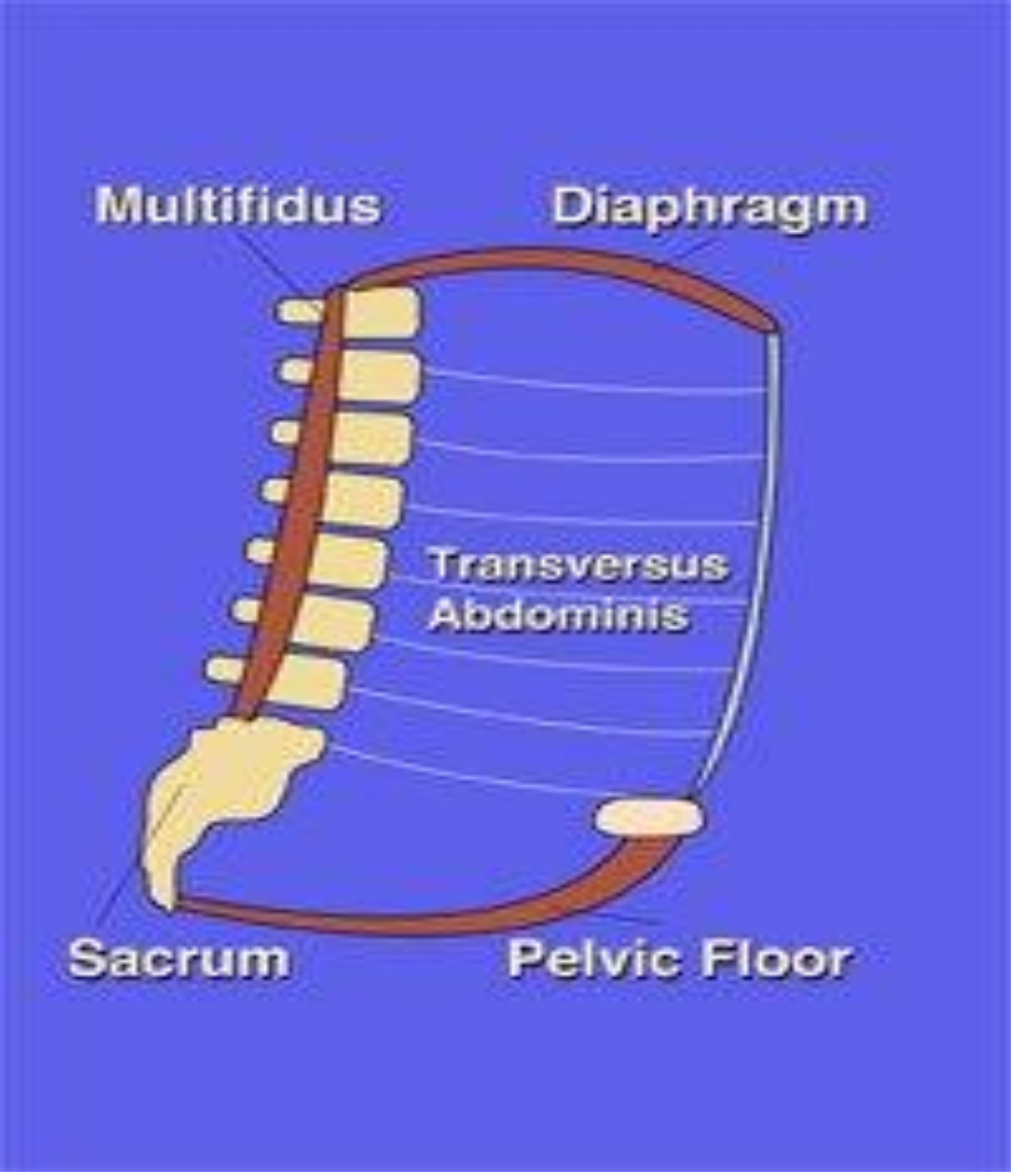

PIRATES
PIRATES
29
Topps
RICK
RHODEN

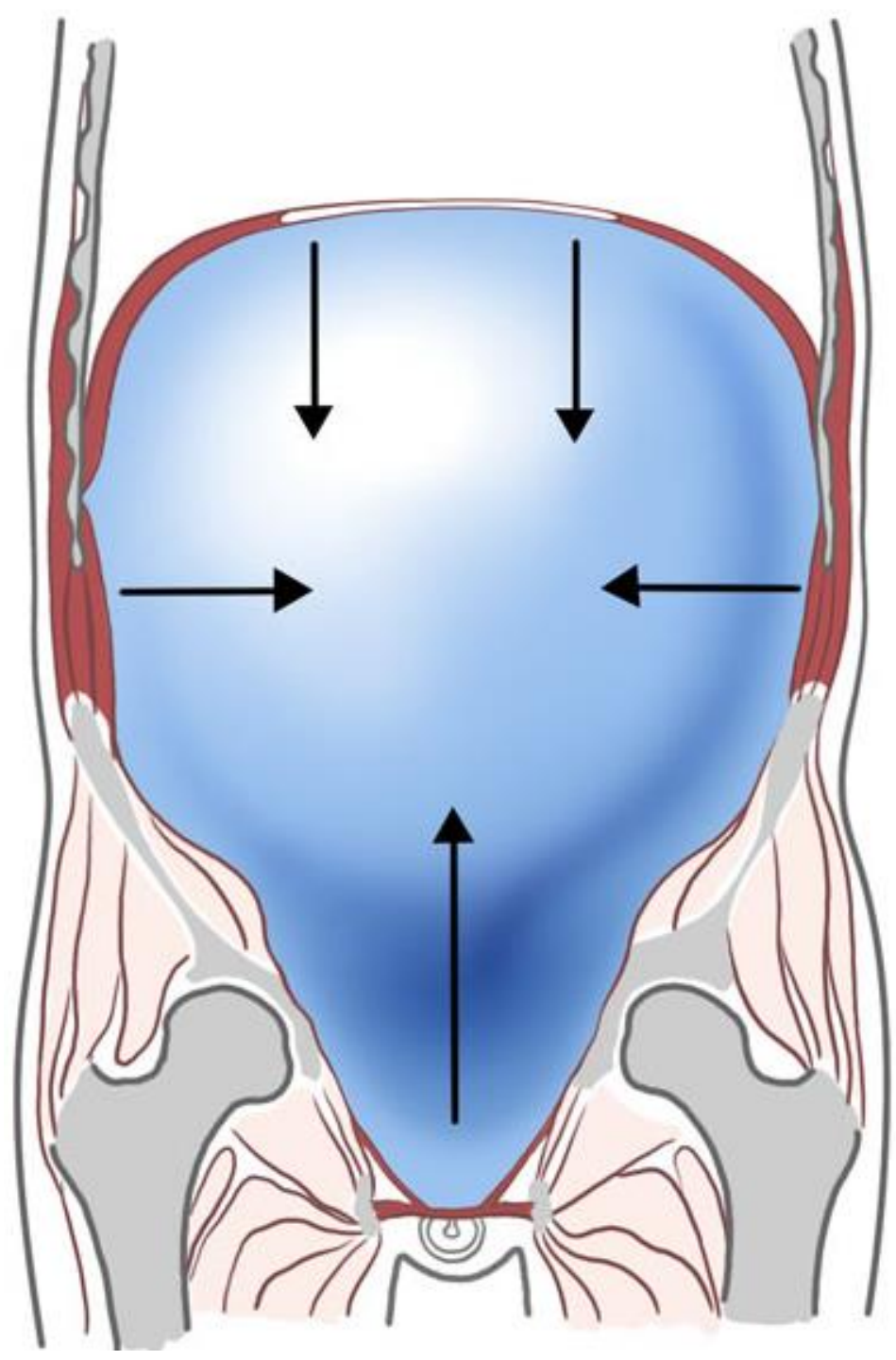
# CONTEMPORARY ABDOMINAL WALL FUNCTION

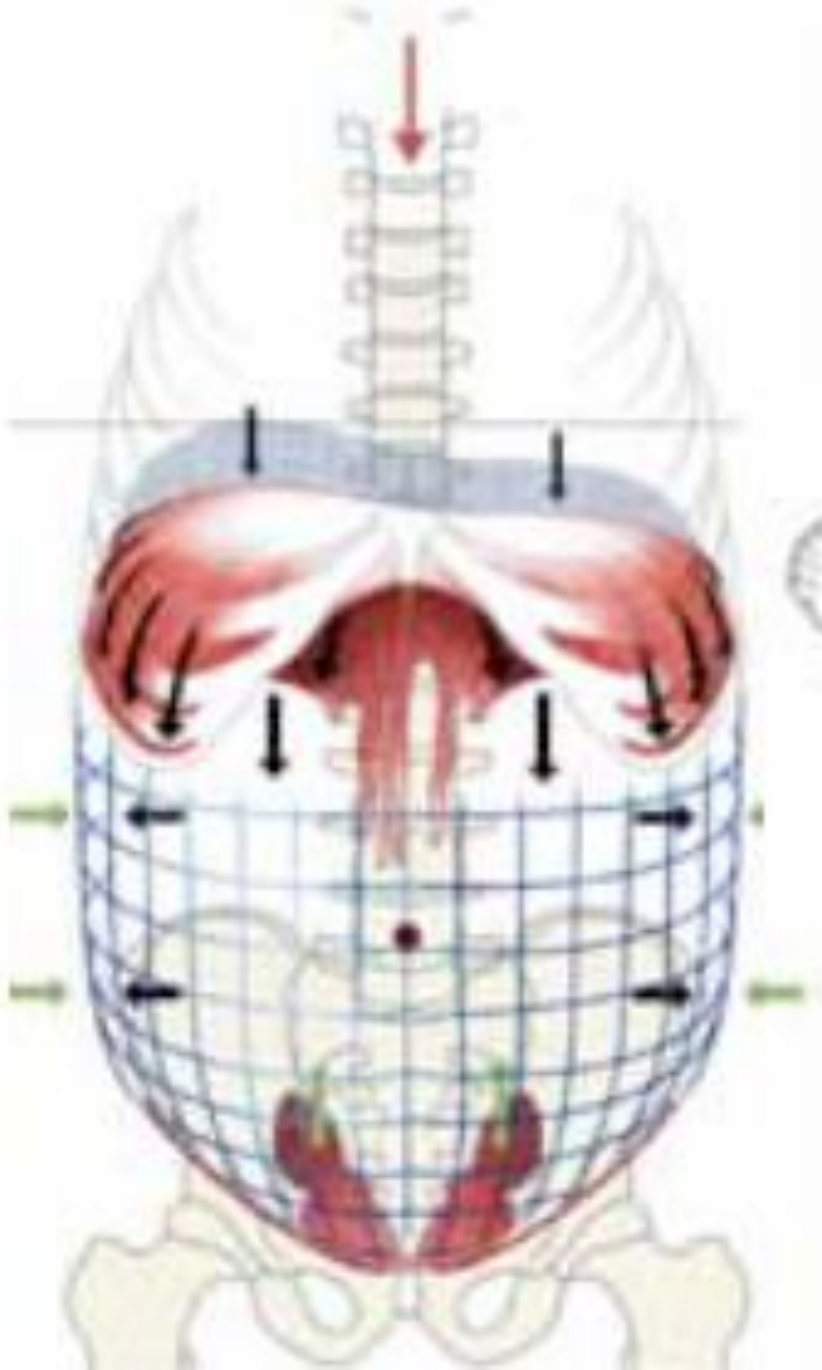
# The low back is stabilized via intra-abdominal pressure



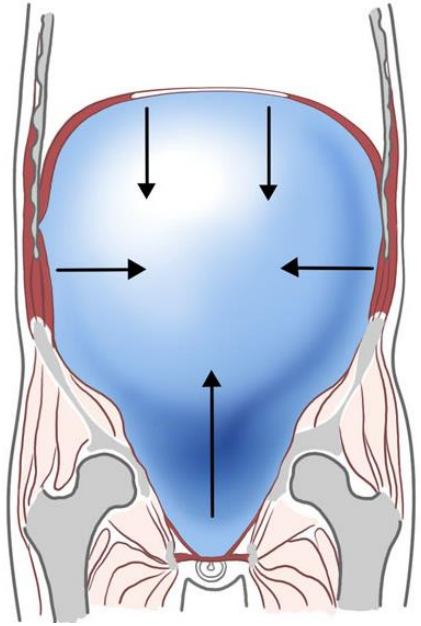


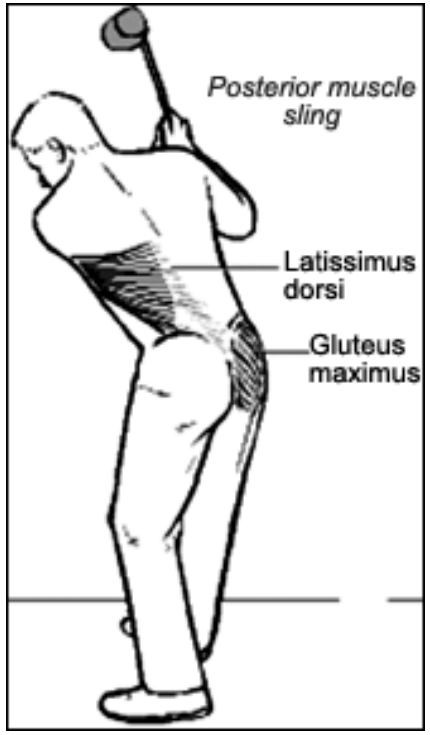

Multifidus
Diaphragm
Transversus
Abdominis
Sacrum
Pelvic Floor

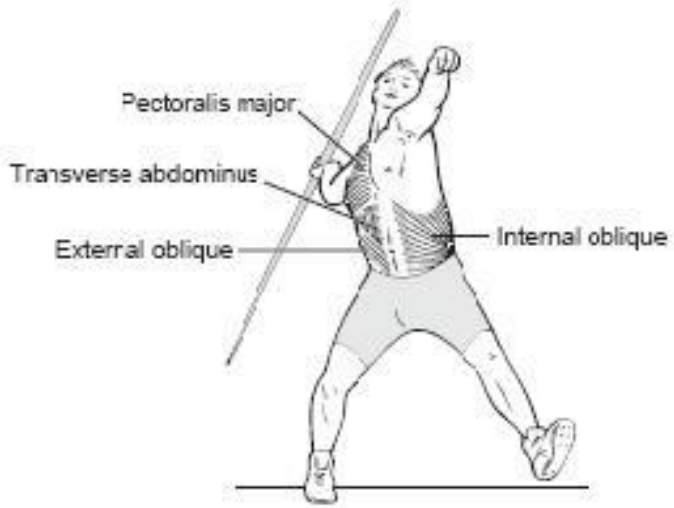


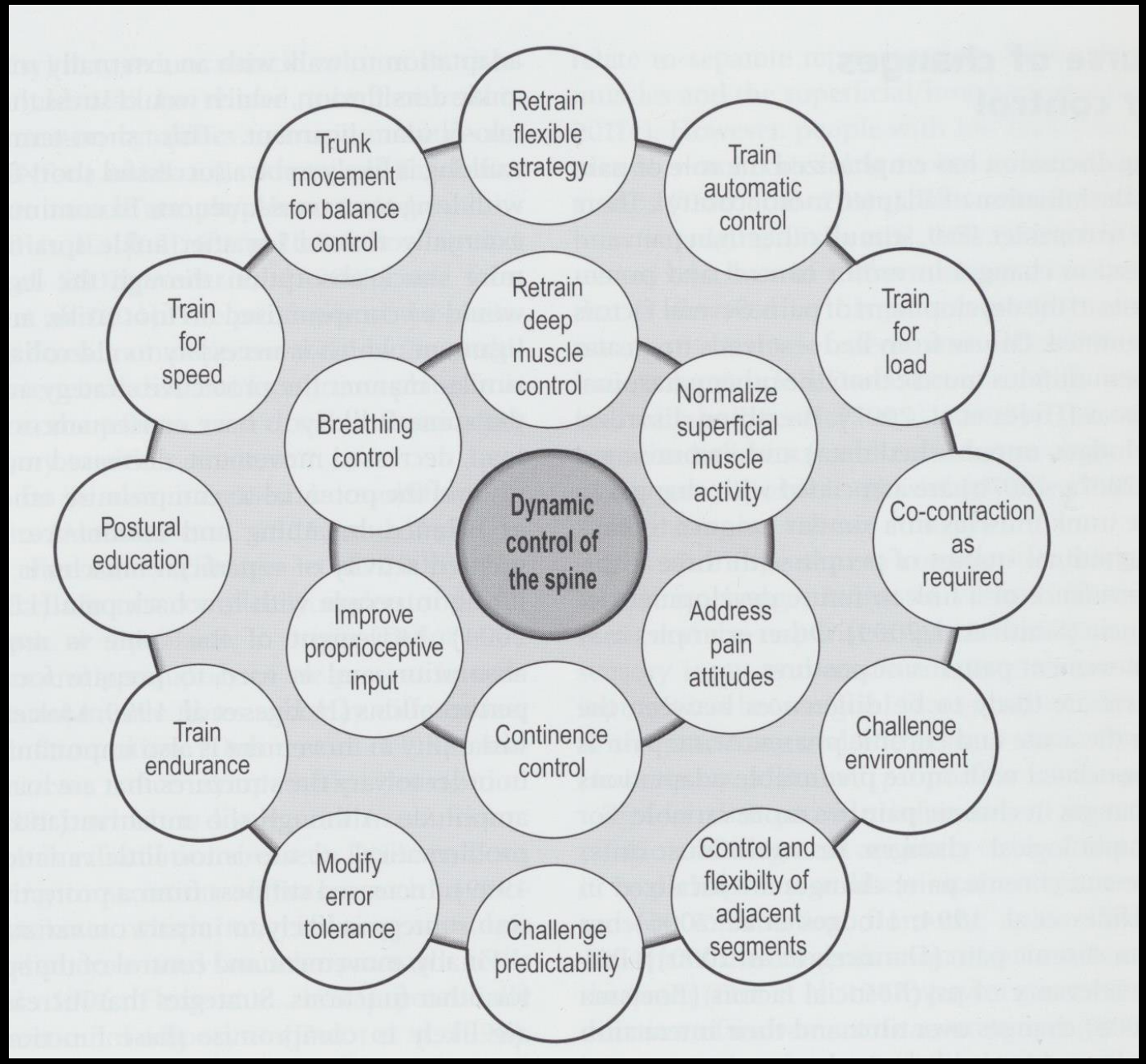


***must establish IAP first**






Retrain flexible strategy
Train automatic control
Train for load
Co-contraction as required
Challenge environment
Control and flexibilty of adjacent segments
Challenge predictability
Modify error tolerance
Train endurance
Postural education
Train for speed
Trunk movement for balance control
Retrain deep muscle control
Normalize superficial muscle activity
Address pain attitudes
Continence control
Improve proprioceptive input
Breathing control
Dynamic control of the spine

***Hodges, 2013***

# TERMINOLOGY

Valsalva

Motor Control

*Core Exercises*

KEGEL

**Intra-Abdominal Pressure (IAP)**

Bracing

***Stabilization***

**STIFFNESS**

# Example:

**Intra-Abdominal Pressure-** Pressurizing the abdomen by closing the glottis and bearing down during an exertion exerts hydraulic force down on the pelvic floor and up on the diaphragm, creating a tensile effect over the lumbar spine or at least alleviating some of the compression.

*Morris, Lucas, and Bresler (1961)*

Cresswell et al, 1992

Cholewicki and McGill, 1996

Panjabi, 1992

Hodges and Richardson, 1996

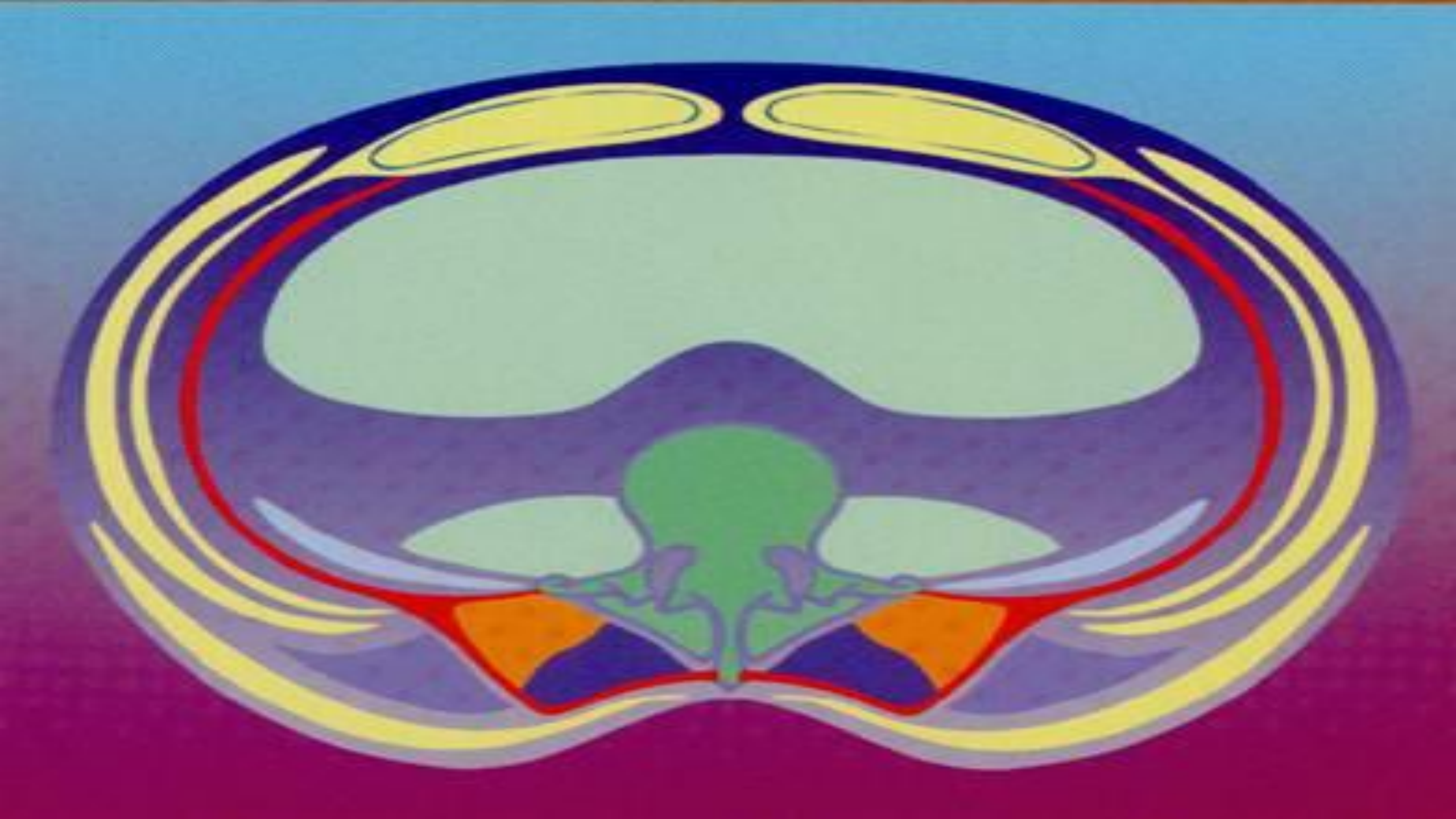
Kolar, 2012

Spine (Phila Pa 1976). 1996 Nov 15;21(22):2640-50.

# Inefficient muscular stabilization of the lumbar spine associated with low back pain. A motor control evaluation of transversus abdominis.

Hodges PW[1], Richardson CA.

**CONCLUSIONS: The delayed onset of contraction of transversus abdominis indicates a deficit of motor control and is hypothesized to result in inefficient muscular stabilization of the spine.**



J Physiol. 1997 Dec 1;505 ( Pt 2)(Pt 2):539-48. doi: 10.1111/j.1469-7793.1997.539bb.x.

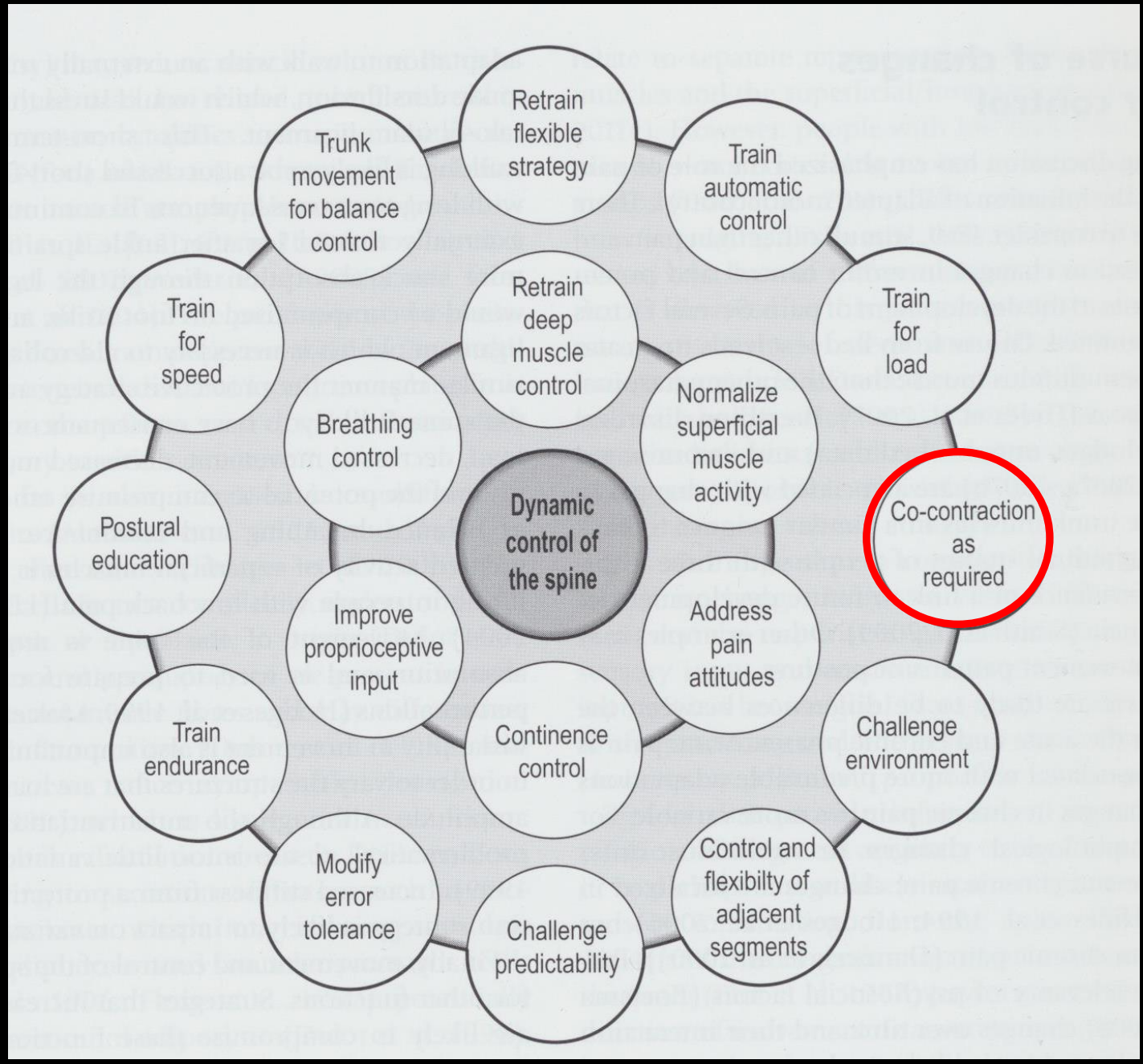
# Contraction of the human diaphragm during rapid postural adjustments

P W Hodges [1], J E Butler, D K McKenzie, S C Gandevia

**With rapid flexion of the shoulder in response to a visual stimulus, EMG activity in the costal and crural diaphragm occurred about 20 ms prior to the onset of deltoid EMG. This anticipatory contraction occurred irrespective of the phase of respiration in which arm movement began.**

**This study provides definitive evidence that the human diaphragm is involved in the control of postural stability during sudden voluntary movement of the limbs.**

**The onset of diaphragm EMG coincided with that of transversus abdominis.**


Retrain flexible strategy
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Retrain deep muscle control
Normalize superficial muscle activity
Breathing control
Continence control
Dynamic control of the spine

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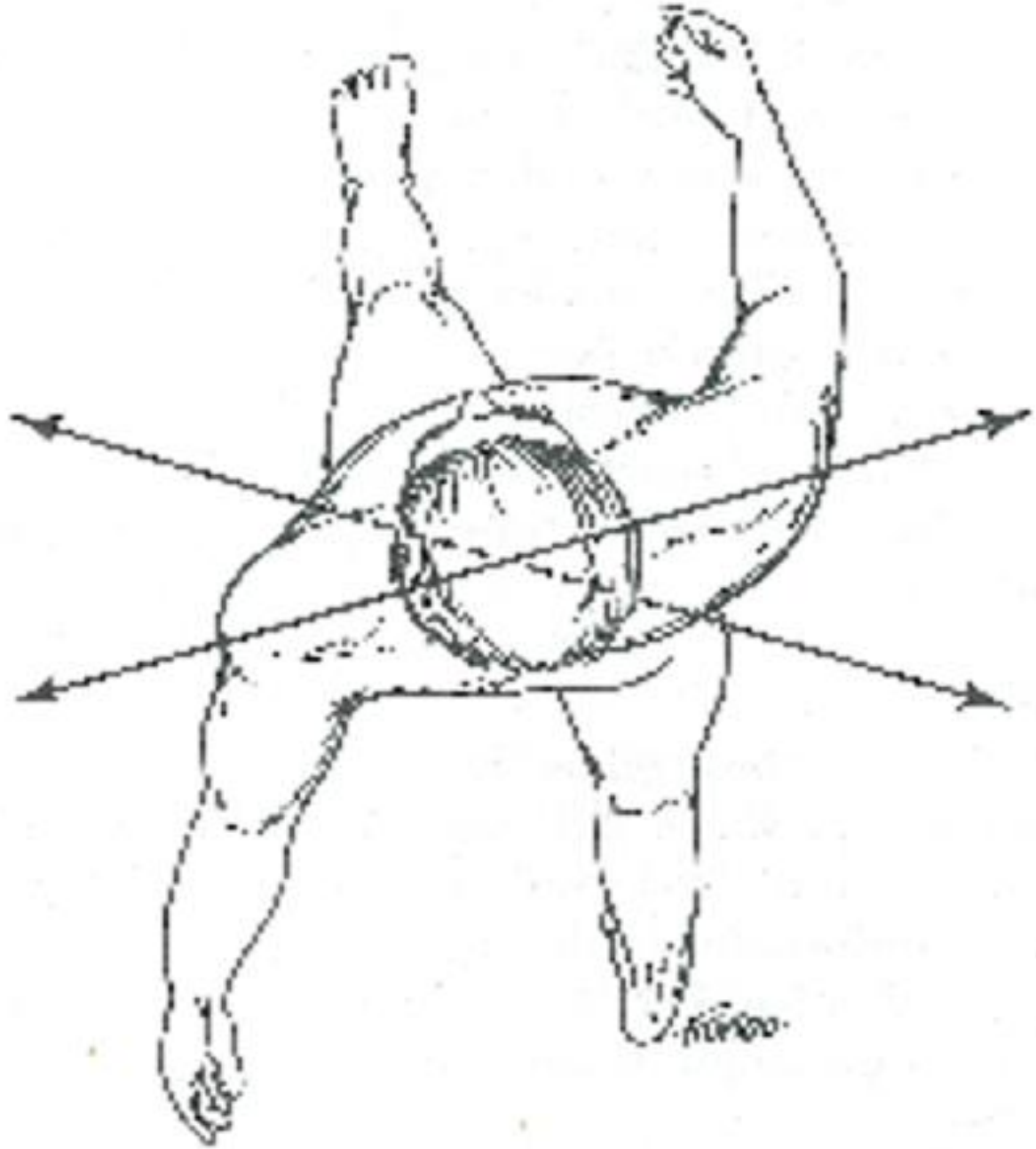
Med Sci Sports Exerc. 1991 Oct;23(10):1179-86.

# Lumbar spine loads during the lifting of extremely heavy weights.

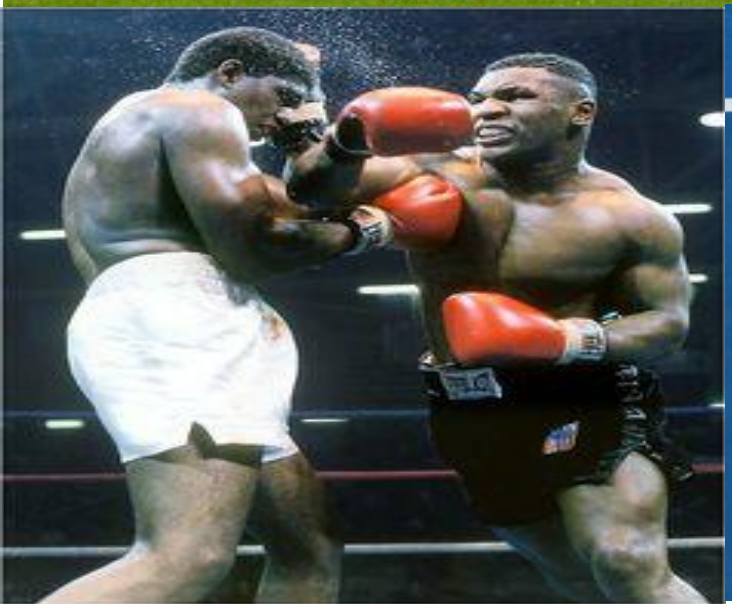
Cholewicki J[1], McGill SM, Norman RW.

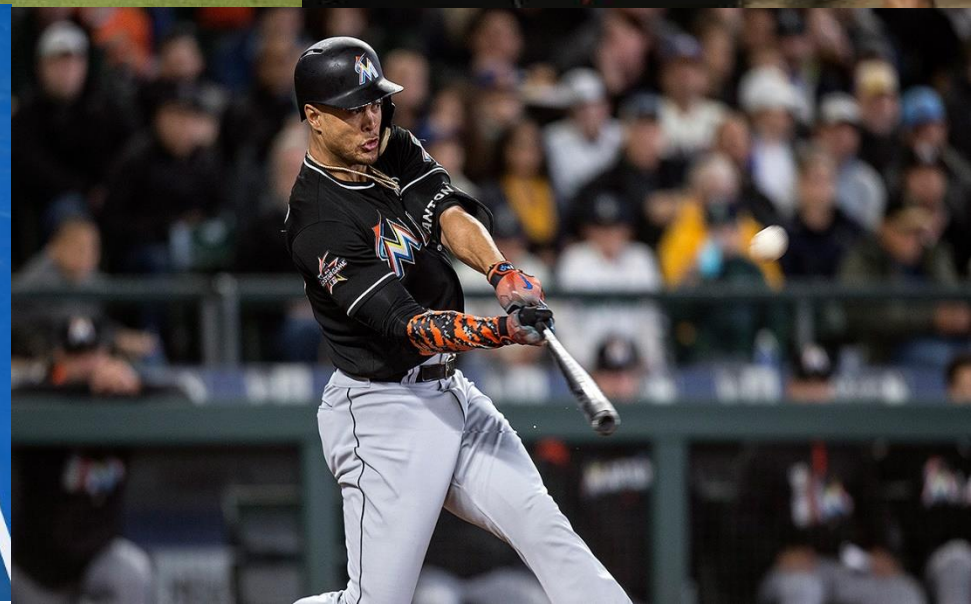
**CONCLUSIONS: At the end of the spectrum the spine is controlled primarily by stiffening strategies such as co-contraction of large flexor and extensor muscles, such as occurs with high load**

# BRACING



# “Brace For Impact”





- So what do you go through
when you do this actually?
TaylorMade
Subscribe

Spine (Phila Pa 1976). 2000 Jun 1;25(11):1398-404.

## Cost-benefit of muscle cocontraction in protecting against spinal instability.

Granata KP[1], Marras WS.

Spine (Phila Pa 1976). 1998 Jan 1;23(1):86-91; discussion 91-2.

## The effects of abdominal muscle coactivation on lumbar spine stability.

Gardner-Morse MG[1], Stokes IA.

**CONCLUSIONS: Trunk muscle co-contraction improves spinal stability but also increases compressive forces.**

J Strength Cond Res. 2014 Dec;28(12):3469-75. doi: 10.1519/JSC.0000000000000604.

# The effects of "grunting" on serve and forehand velocities in collegiate tennis players.

O'Connell DG[1], Hinman MR, Hearne KF, Michael ZS, Nixon SL.

**Author information**

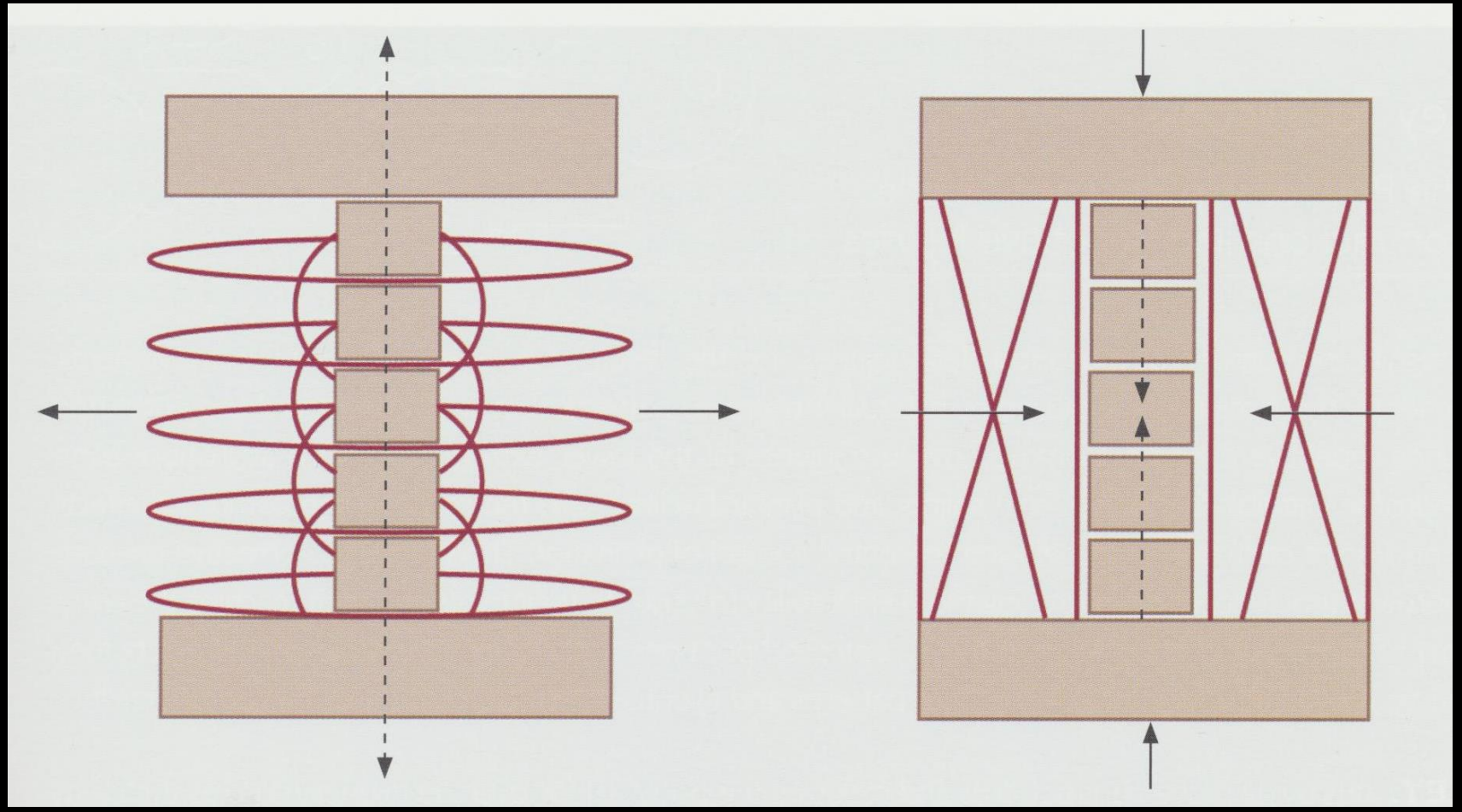
1 Department of Physical Therapy, Applied Physiology Laboratory, Hardin-Simmons University, Abilene, Texas.

**Abstract**

The aim of this study was to examine the effects of grunting on velocity and force production during dynamic and static tennis strokes in collegiate tennis players. Thirty-two (16 male and 16 female) division II and III collegiate tennis athletes with a mean age of 20.2 ± 1.89 years participated as subjects. Demographic and survey data were obtained before subjects completed a 10- to 15-minute warm-up of serves and ground strokes while grunting and not grunting. The subjects performed randomized sets (3 grunting and 3 nongrunting trials) of serves and forehand strokes both dynamically and isometrically. Stroke velocities and isometric forces were measured with a calibrated radar gun and calibrated dynamometer, respectively. Electromyographic (EMG) data from subjects' dominant pectoralis major and contralateral external oblique muscles were recorded and averaged for data analysis. A repeated measures multivariate analysis of variance (RM-MANOVA) compared dynamic stroke velocity, isometric muscle force, and peak EMG activity during each breathing condition at the 0.05 alpha level. The RM-MANOVA indicated that dynamic velocity and isometric force of both serves and forehand strokes were significantly greater when the subjects grunted ($F = 46.572$, $p < 0.001$, power = 1.00). Peak muscle activity in the external oblique and pectoralis major muscles was also greater when grunting during both types of strokes ($F = 3.867$, $p = 0.05$, power = 0.950). Grunt history, gender, perceived advantages, and disadvantages of grunting, years of experience, highest level of competition, and order of testing did not significantly alter any of these results. The velocity, force, and peak muscle activity during tennis serves and forehand strokes are significantly enhanced when athletes are allowed to grunt.

**CONCLUSIONS: The velocity, force, and peak muscle activity during tennis serves and forehand strokes are significantly enhanced when athletes are allowed to grunt.**

# IAP vs BRACING



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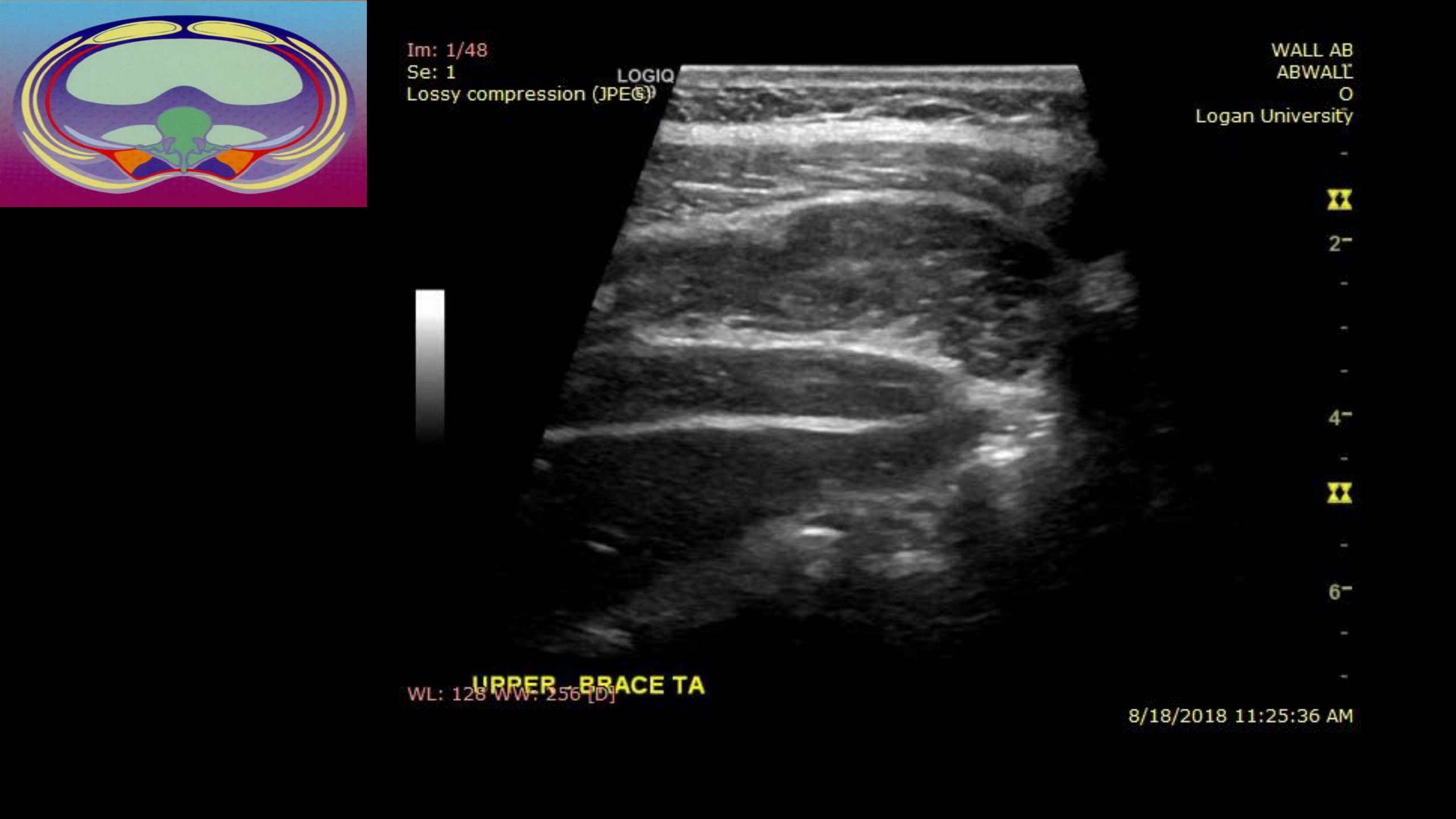
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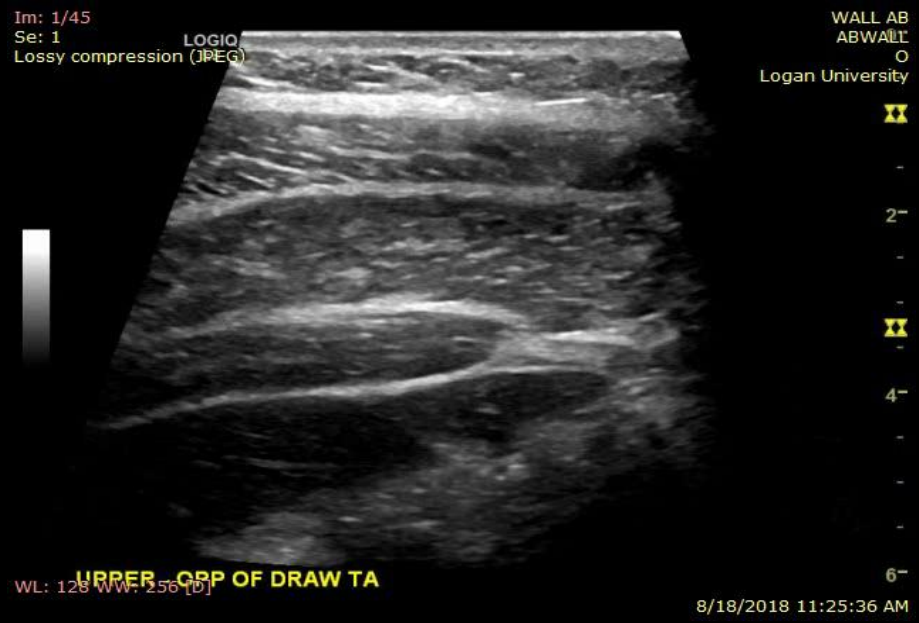
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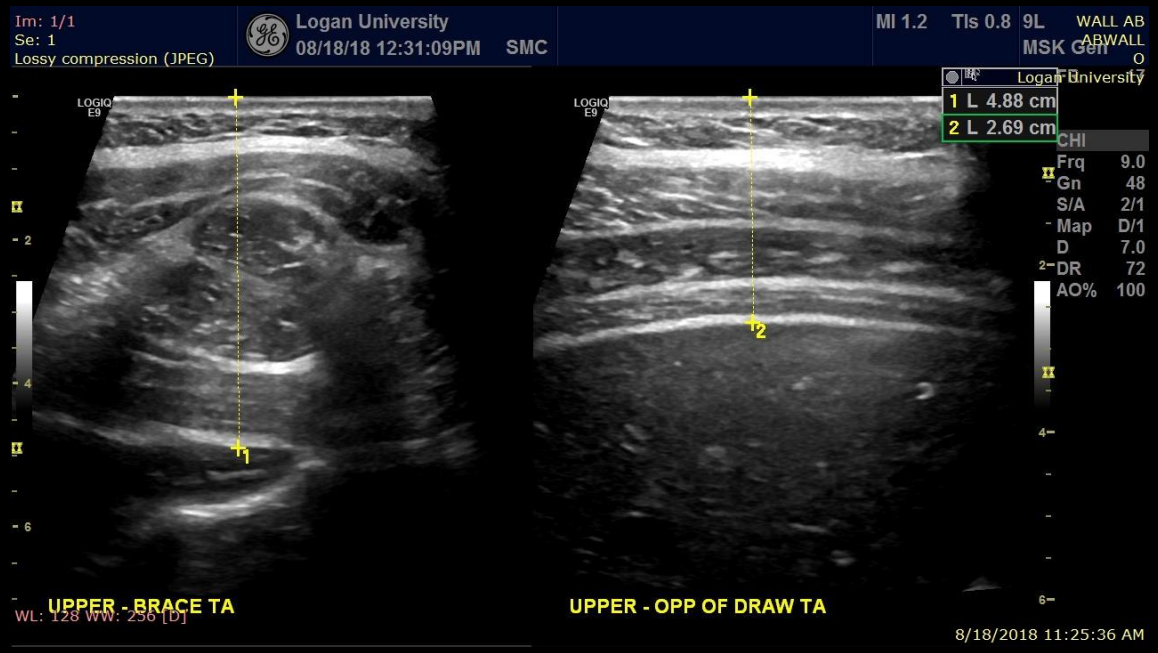
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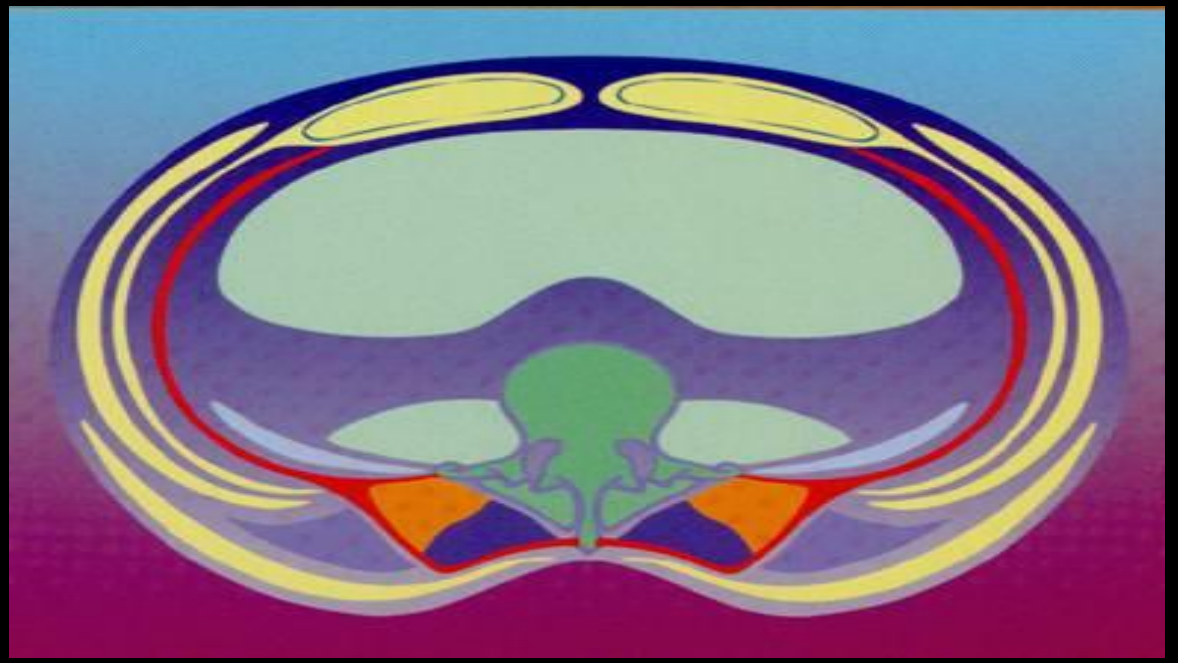

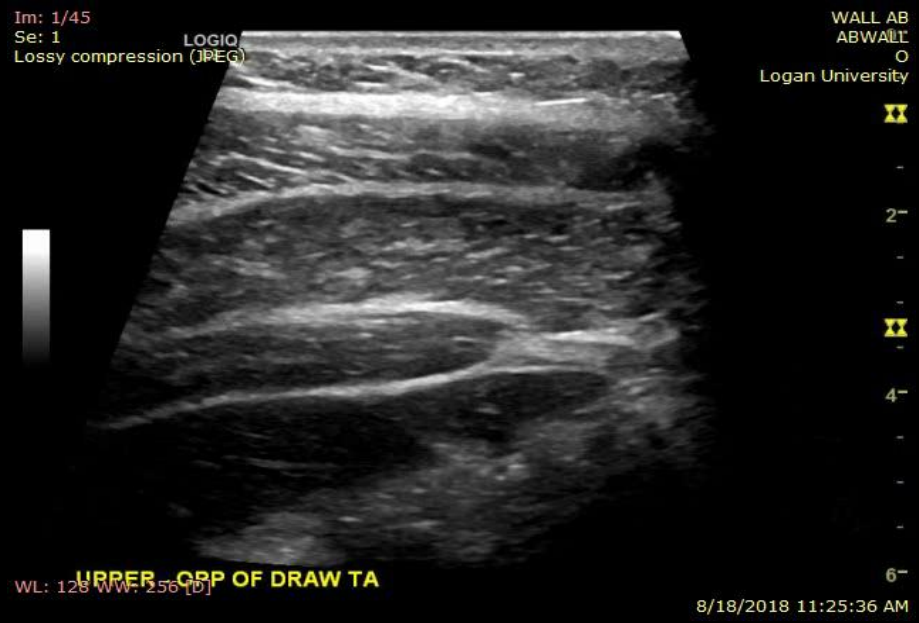
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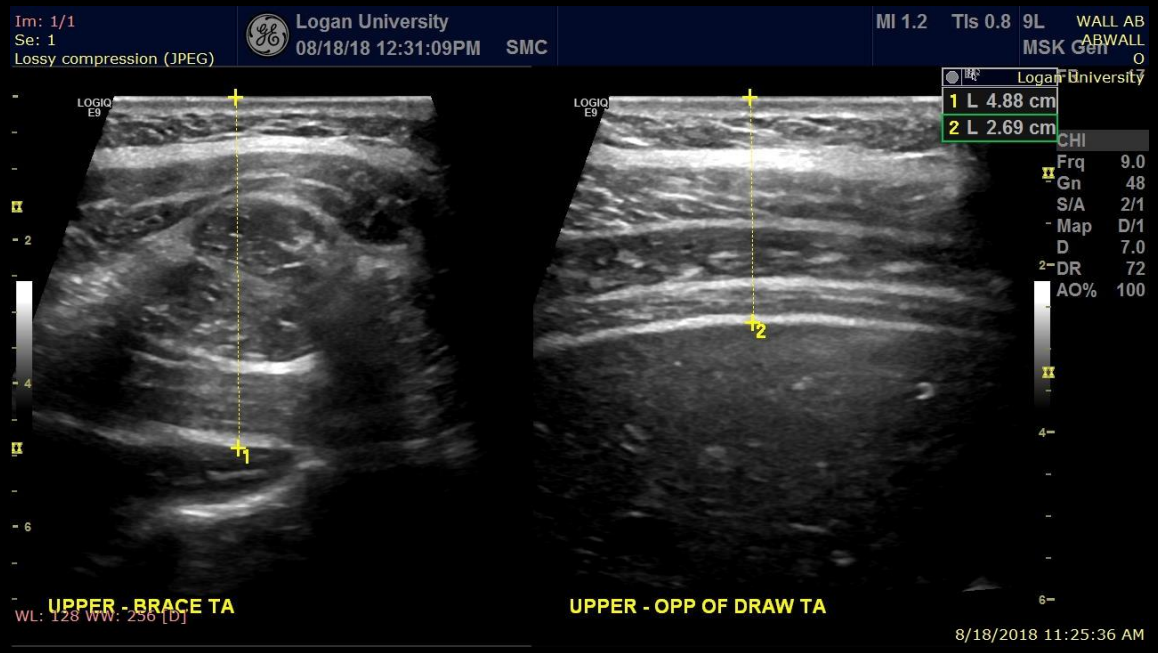
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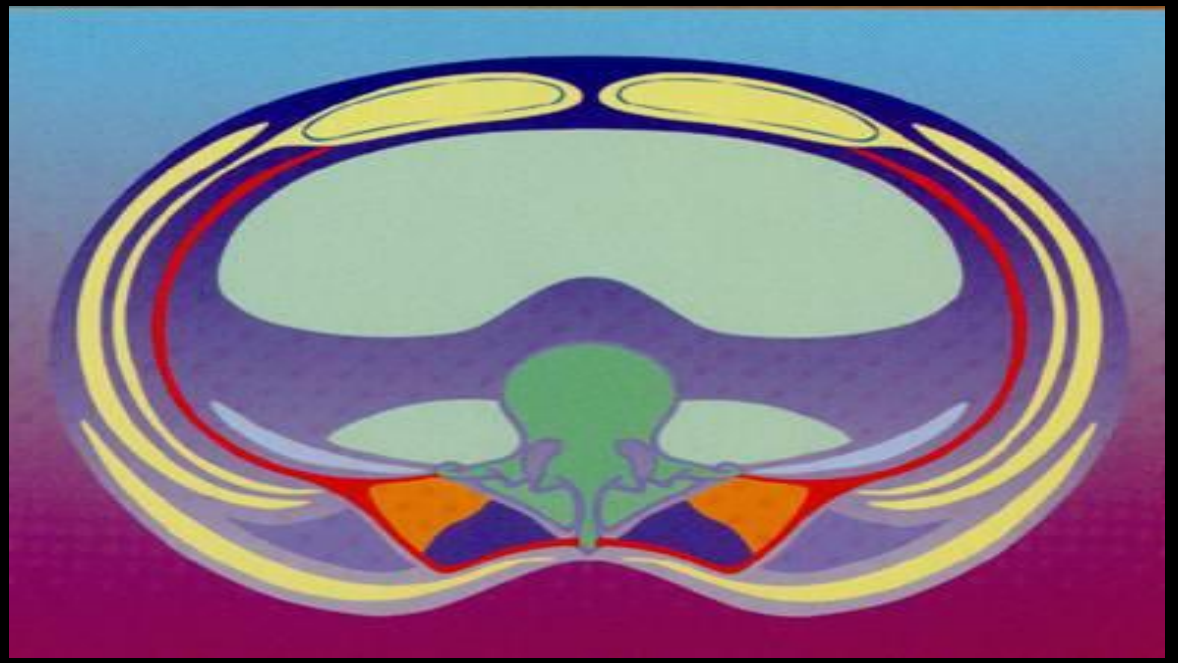
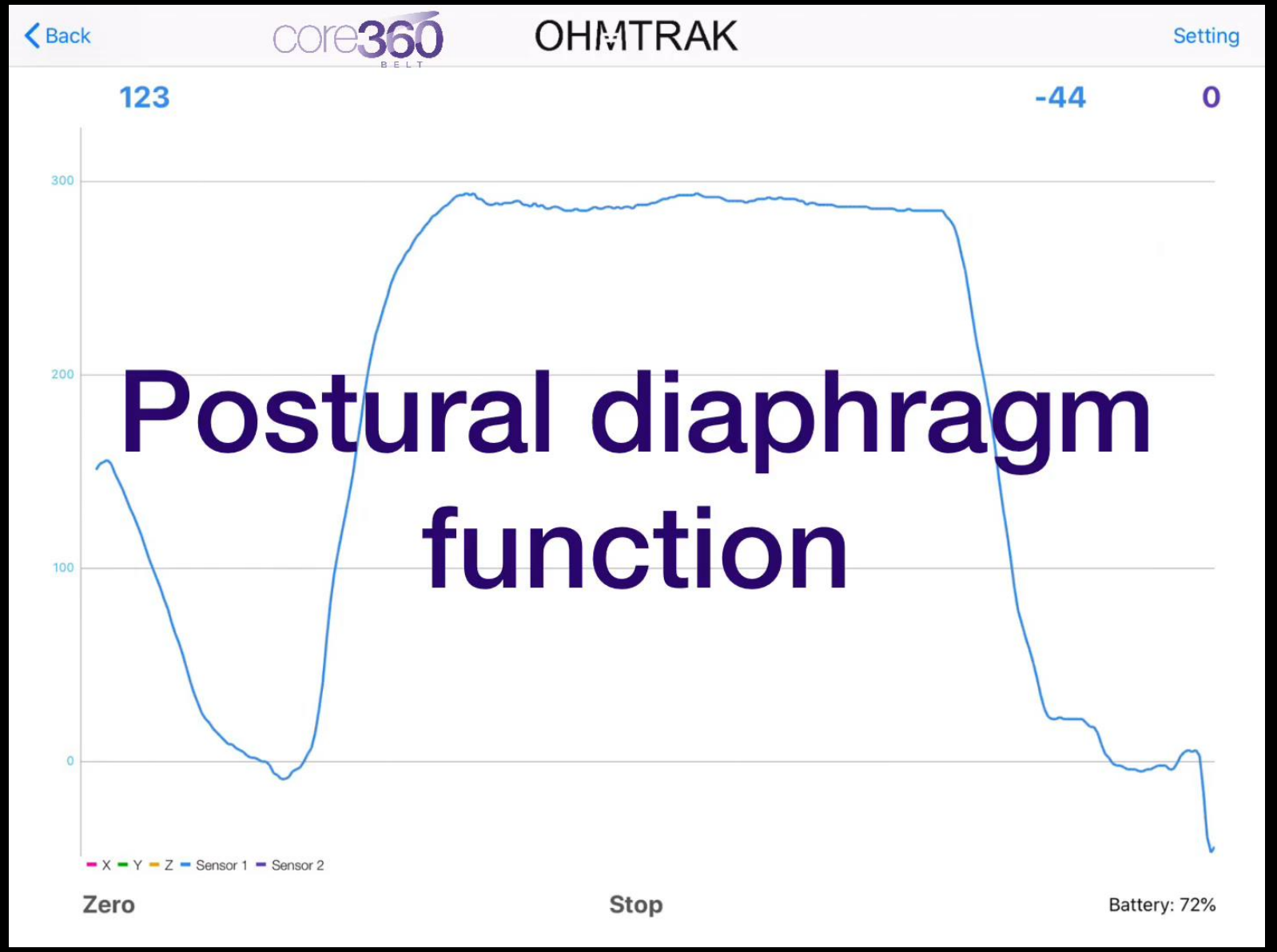




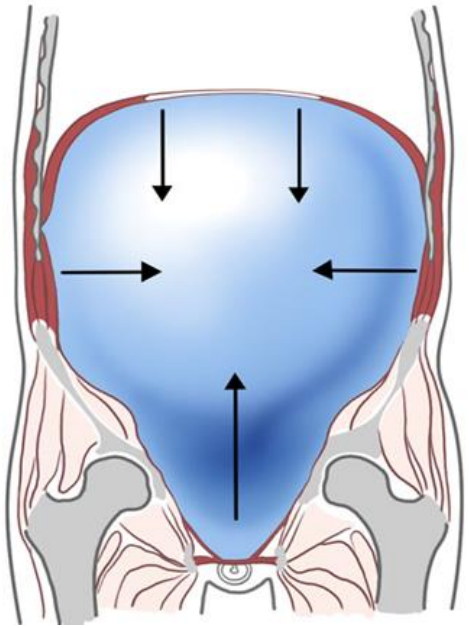

# Postural diaphragm function

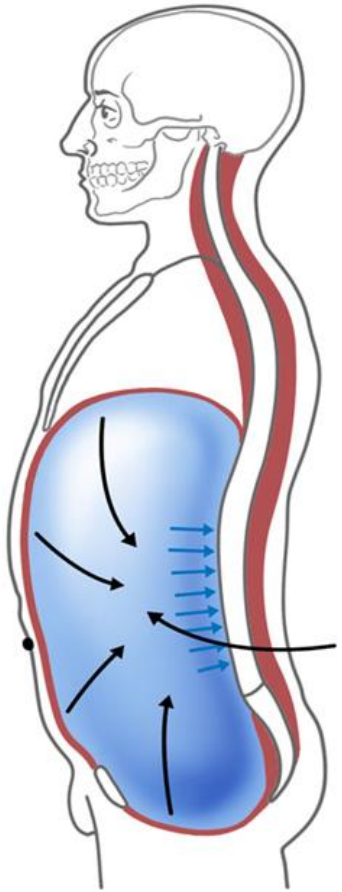
wellsyst

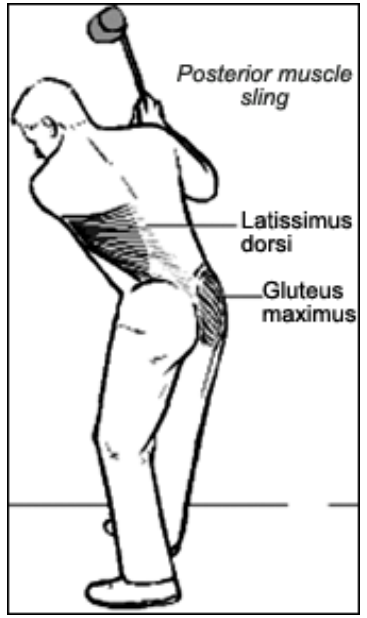
# “Every developmental position is an exercise position”

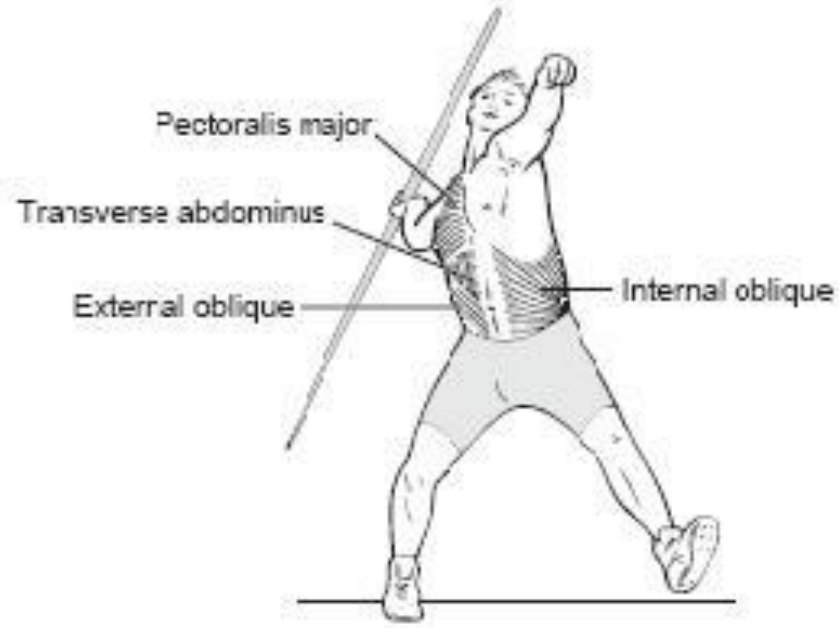
***...Pavel Kolář***

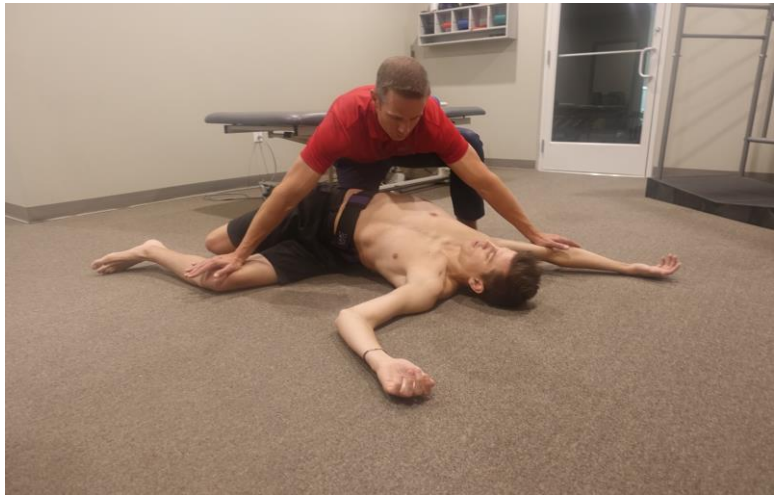
# *must establish IAP first

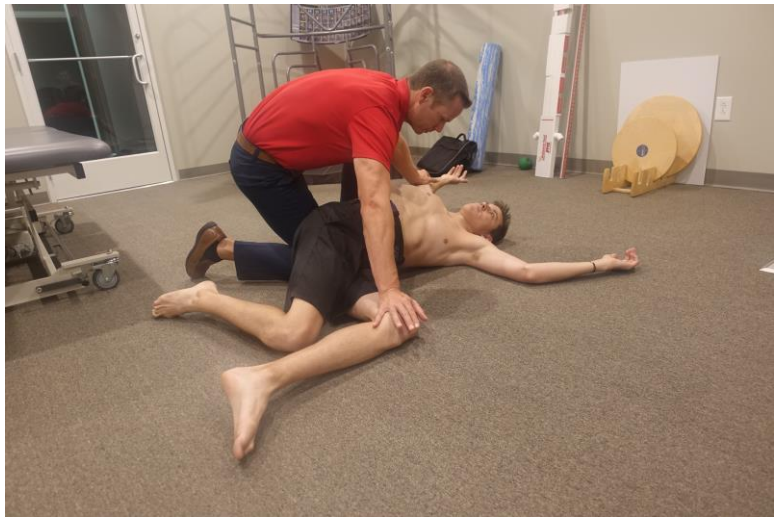










Mets
41

“To improve fascia performance, you must remove tissue densification”
Dr. Antonio Stecco
TRULY
Hard Seltzer

# KINETIC CHAIN

**Specific motions at certain segments of the kinetic chain have a dramatic effect in movement of other joints (or lack there of), and the turning on or off of certain muscles.**

*(Gray, 2005)*

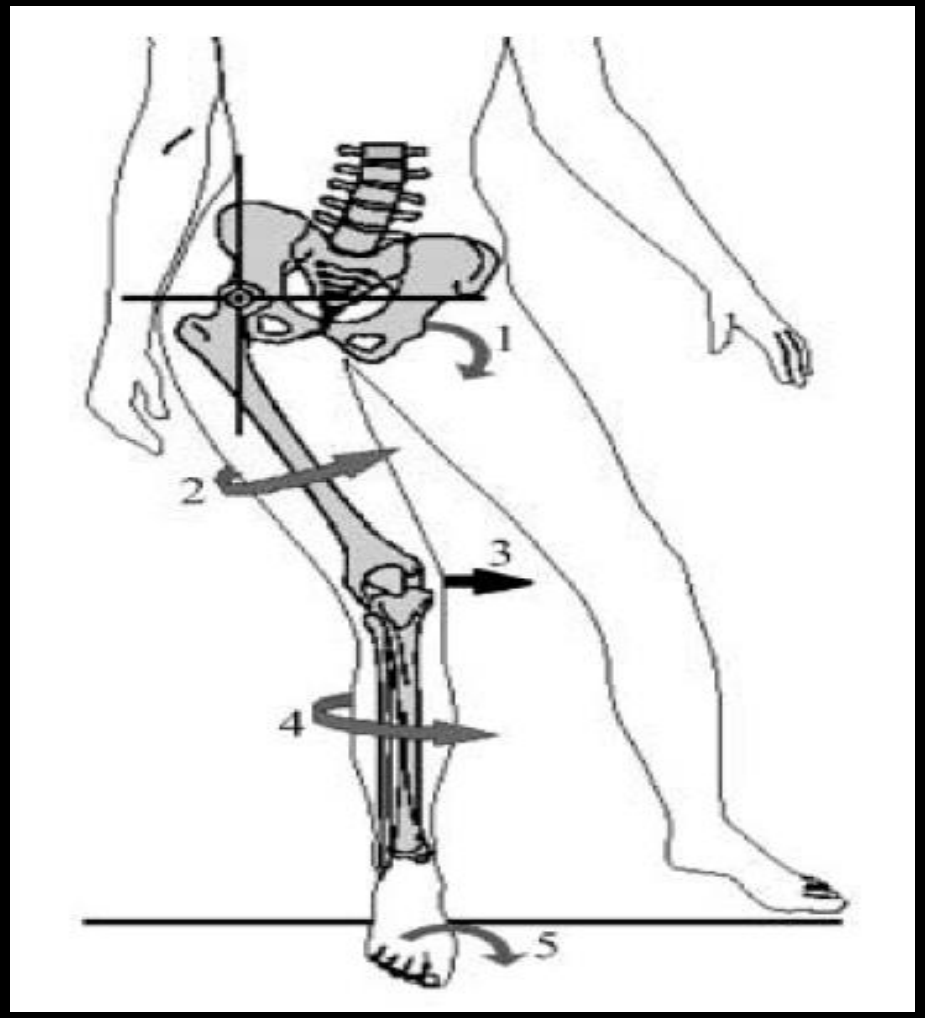
# REGIONAL INTERDEPENCE

**Regional interdependence is the concept that seemingly unrelated impairments in a remote anatomical region may contribute to, or be associated with, the patient's primary complaint**

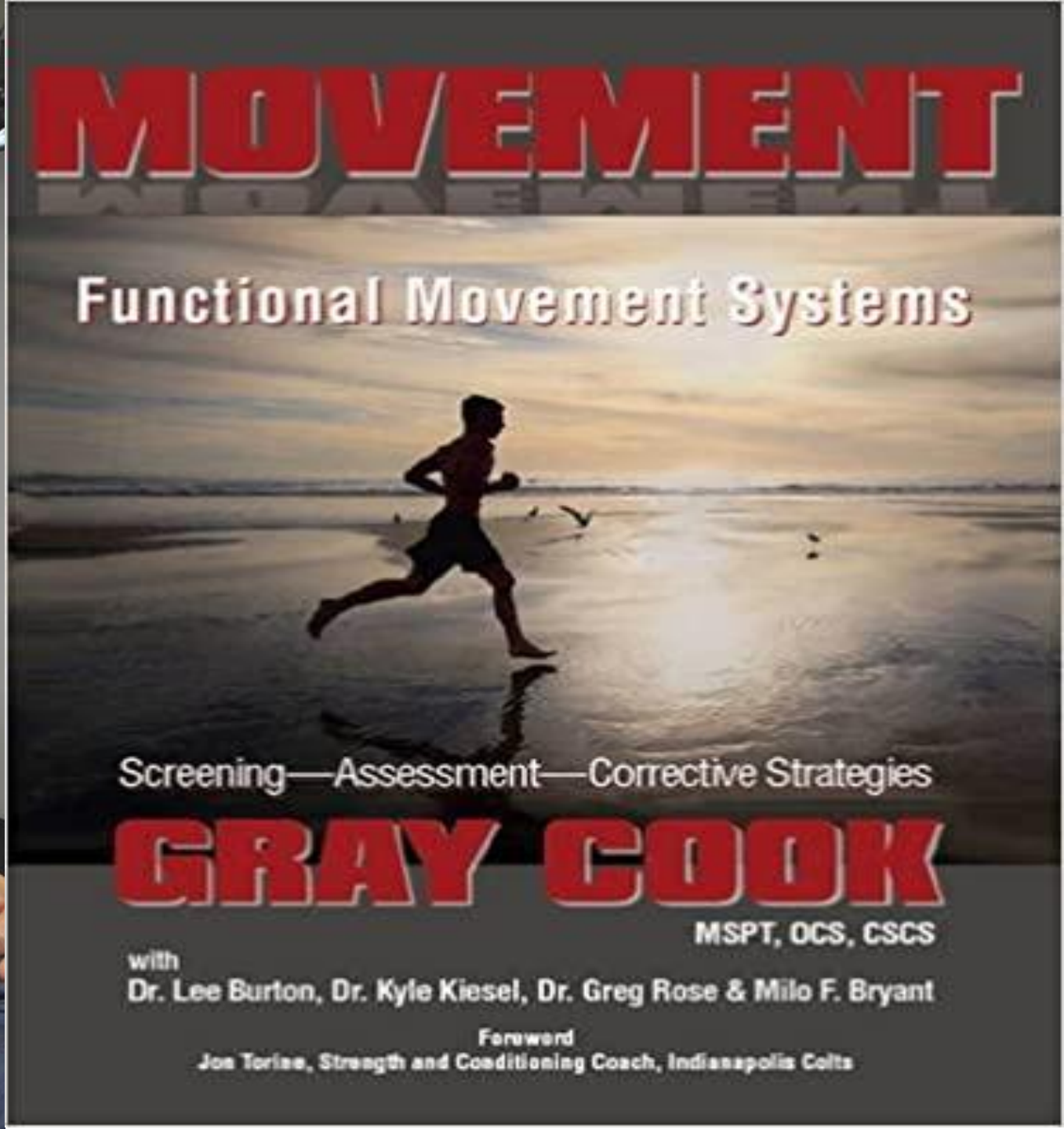
**Current research has shown that regional interdependence can be affected not only by other regions in the musculoskeletal system but impairments from varying body systems and regions**

*Sueki DG, Cleland JA, Wainner RS. A regional interdependence model of musculoskeletal dysfunction: research, mechanisms, and clinical implications. J Man Manip Ther. 2013 May;21(2):90–102.*

# Kinetic Chain



- Specific motions at certain segments of the kinetic chain have a dramatic effect in movement of other joints (or lack there of), and the turning on or off of certain muscles
- *(Gray, 2005)*


MOVEMENT
Functional Movement Systems
Screening—Assessment—Corrective Strategies
GRAY COOK
MSPT, OCS, CSCS
with
Dr. Lee Burton, Dr. Kyle Kiesel, Dr. Greg Rose & Milo F. Bryant
Foreword
Jon Torine, Strength and Conditioning Coach, Indianapolis Colts

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HUMAN LOCOMOTION
The Conservative Management of Gait-Related Disorders
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# MULTI-PLANAR REACHES

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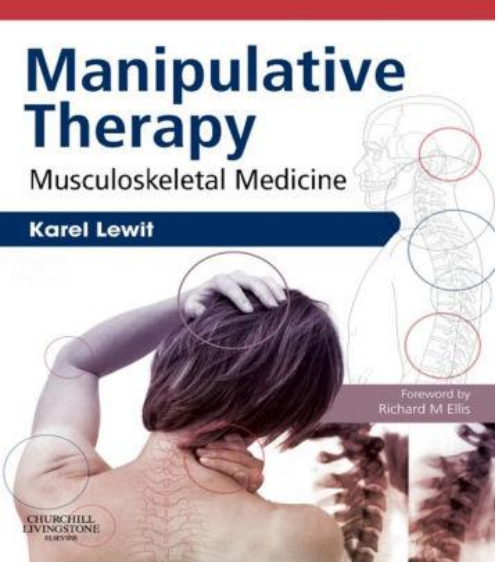
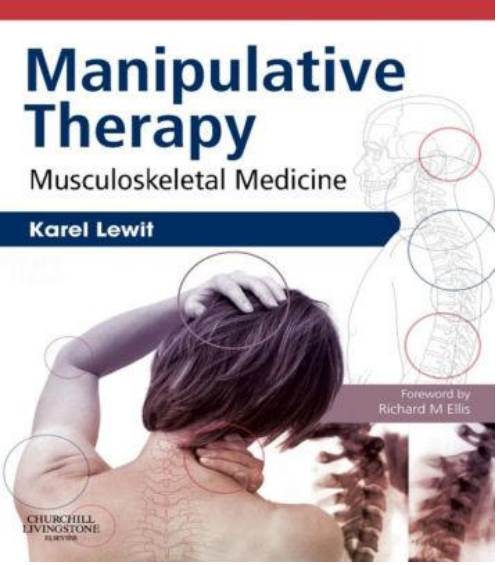



**“Any disturbance of function will in a single motion segment will have its repercussions throughout the spinal column an must be compensated”**

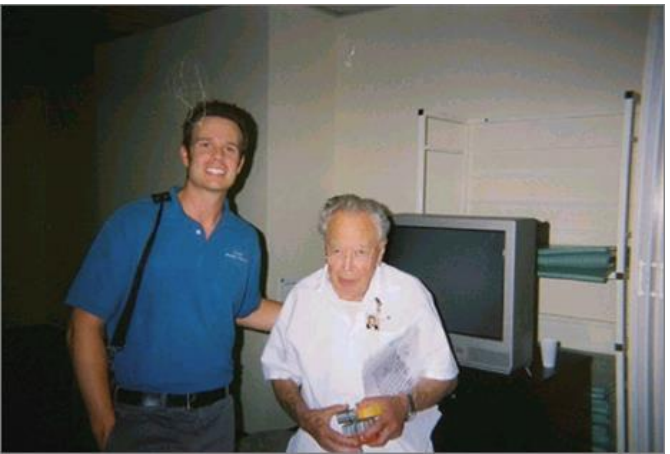
***(Karel Lewit)***




**“Dysfunctions of joint and vertebral motion segments fall into two categories: hypermobility and restricted mobility.”**

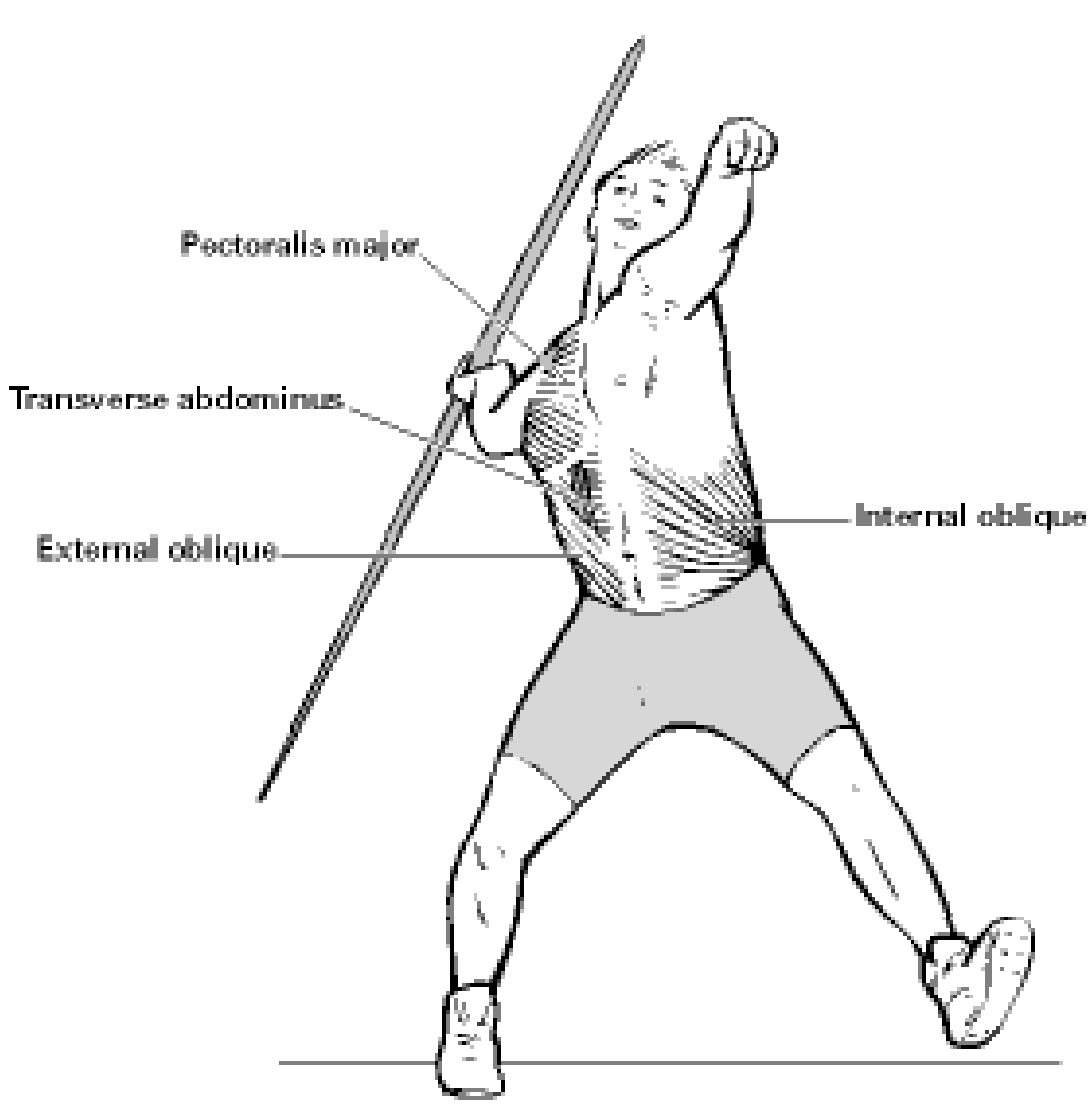
**“Manipulative therapy is concerned only with restricted mobility”**

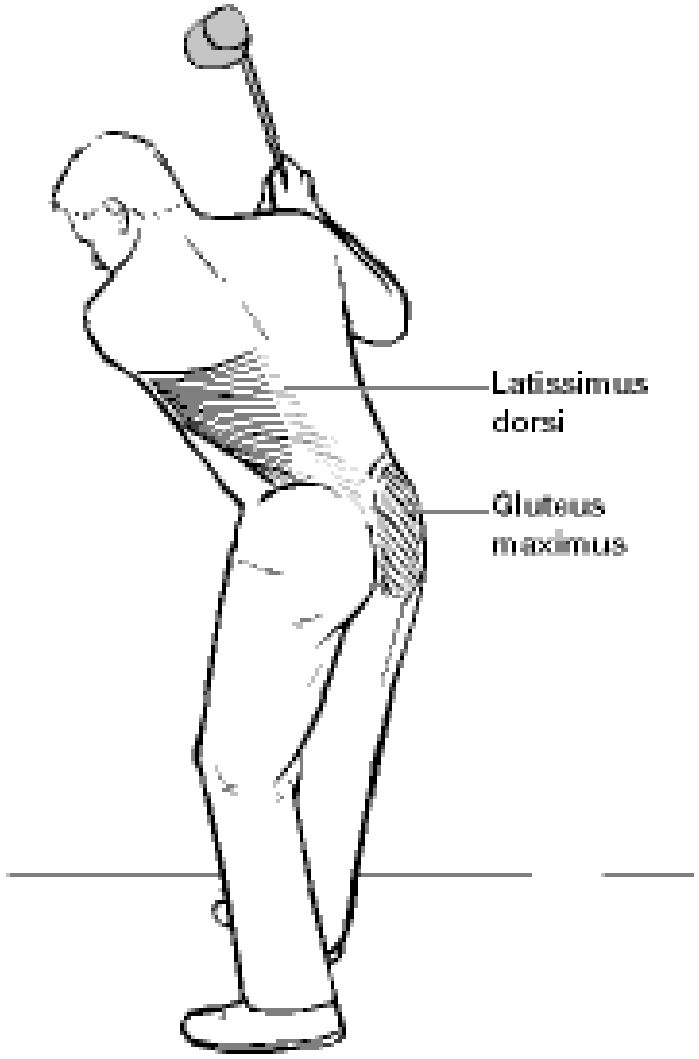
***(Karel Lewit)***

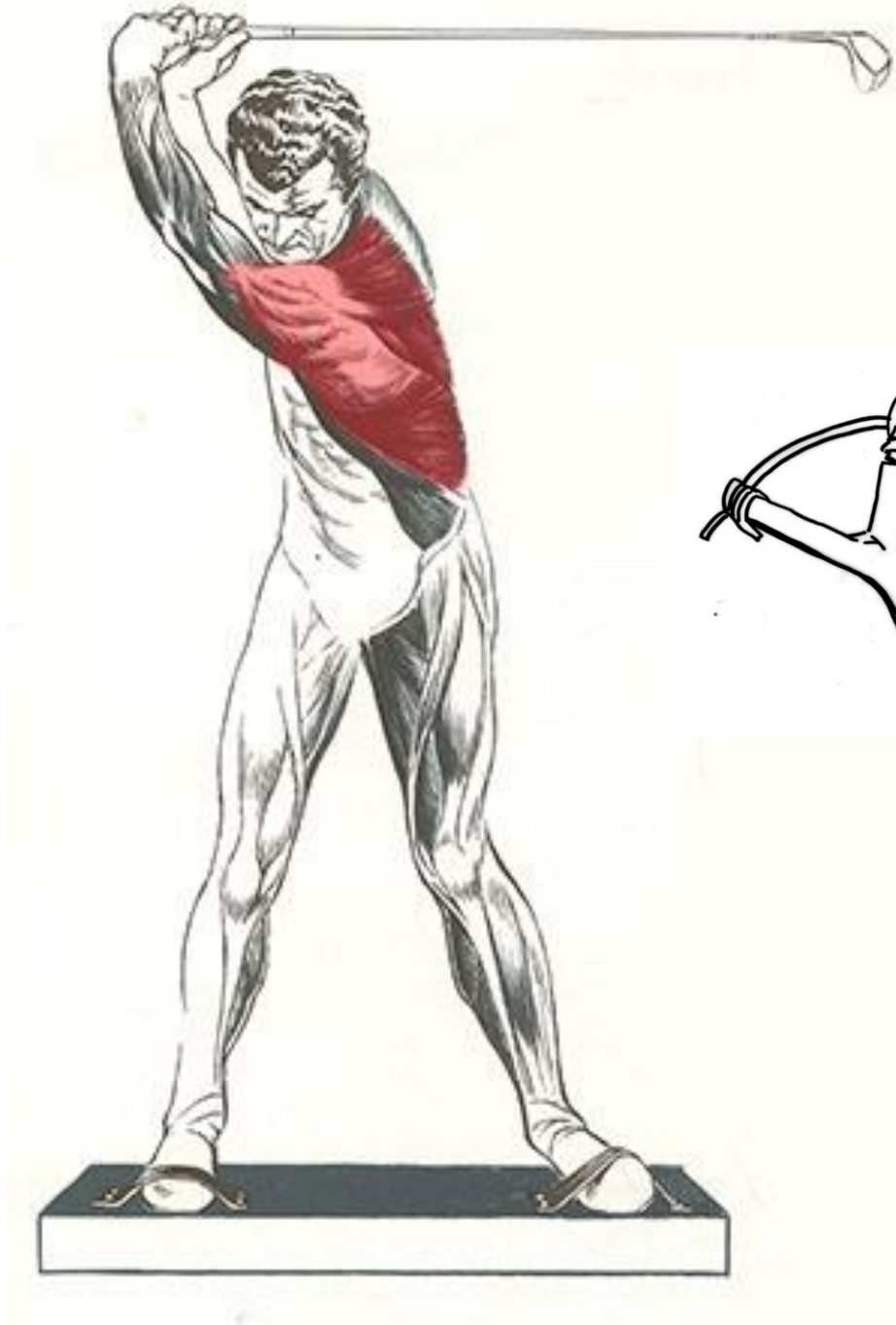


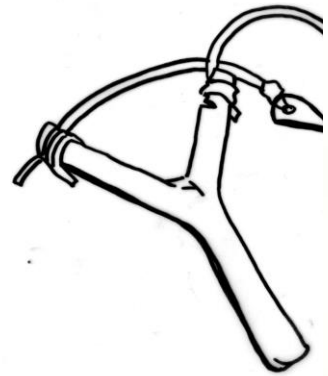
# JOINT DISSOCIATION

# JOINT DISASSOCIATION/ISOLATED MOVEMENT


Pectoralis major
Transverse abdominus
External oblique
Internal oblique

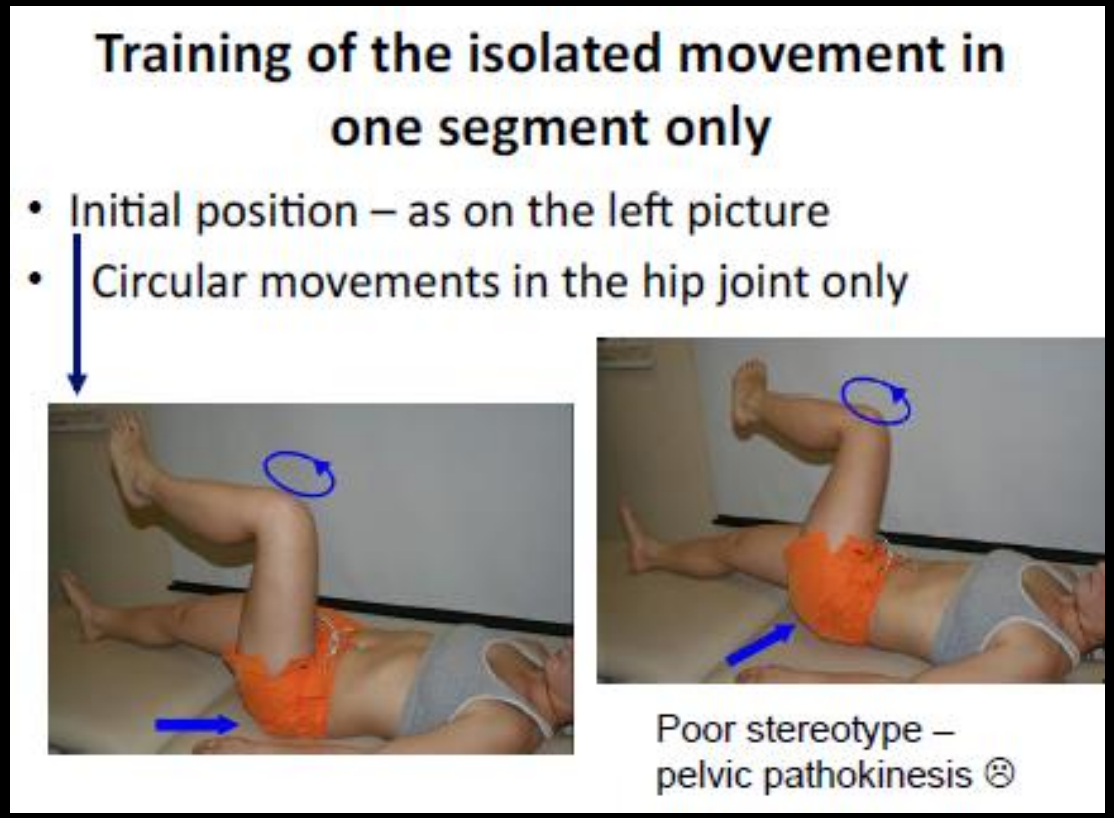

Latissimus dorsi
Gluteus maximus



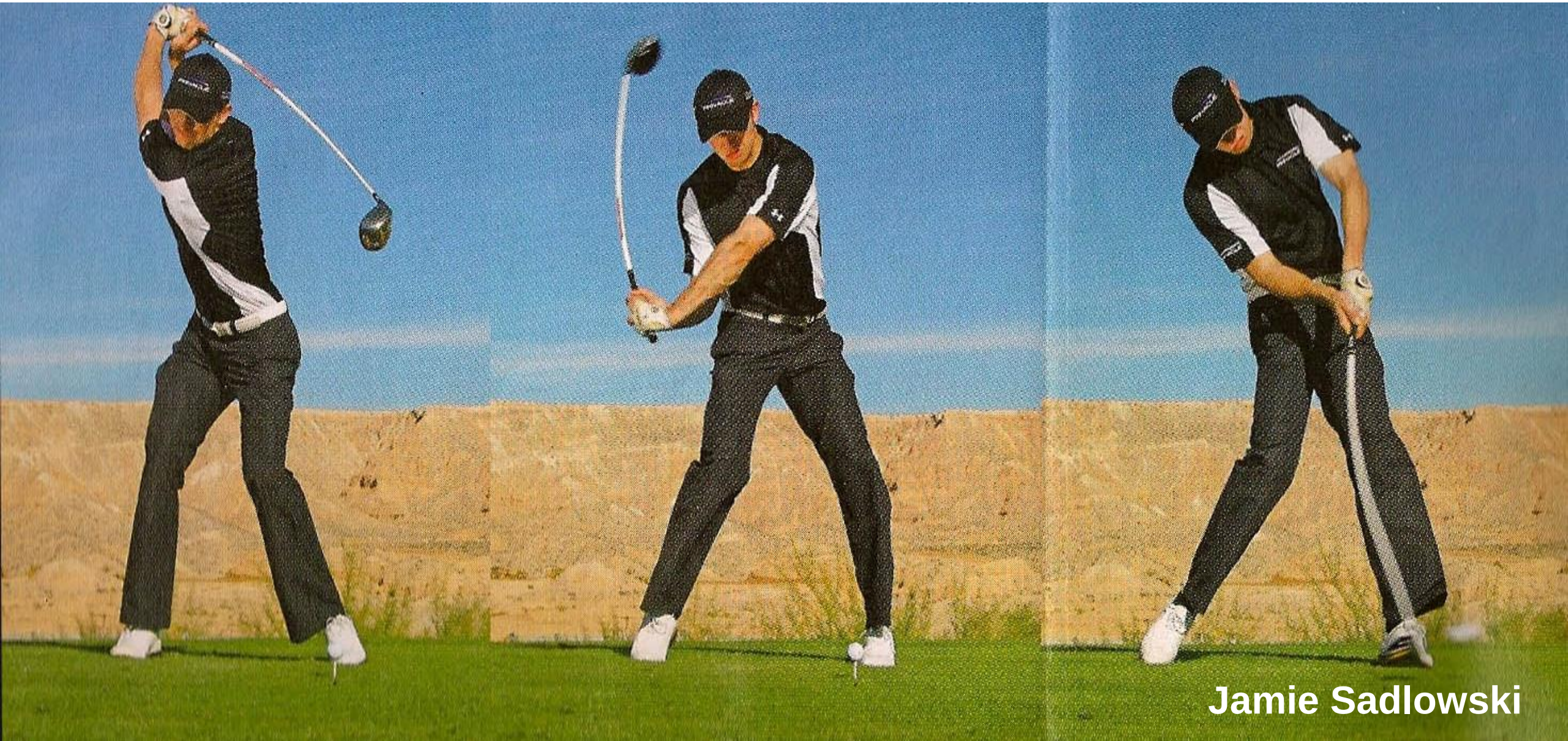


# KEY AREAS OF DISASSOCIATION

- Sub-Talar Joint
- Hip Joint
- Thoracic-Spine/ Rib-cage
- Gh joint/Scapula
- Cervical Spine/ Thoracic Spine

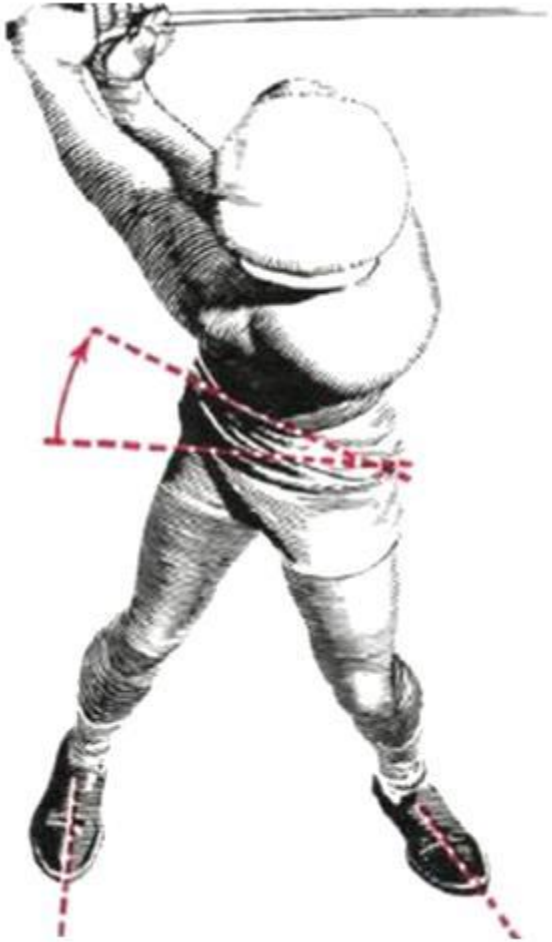


# SUB-TALAR JOINT



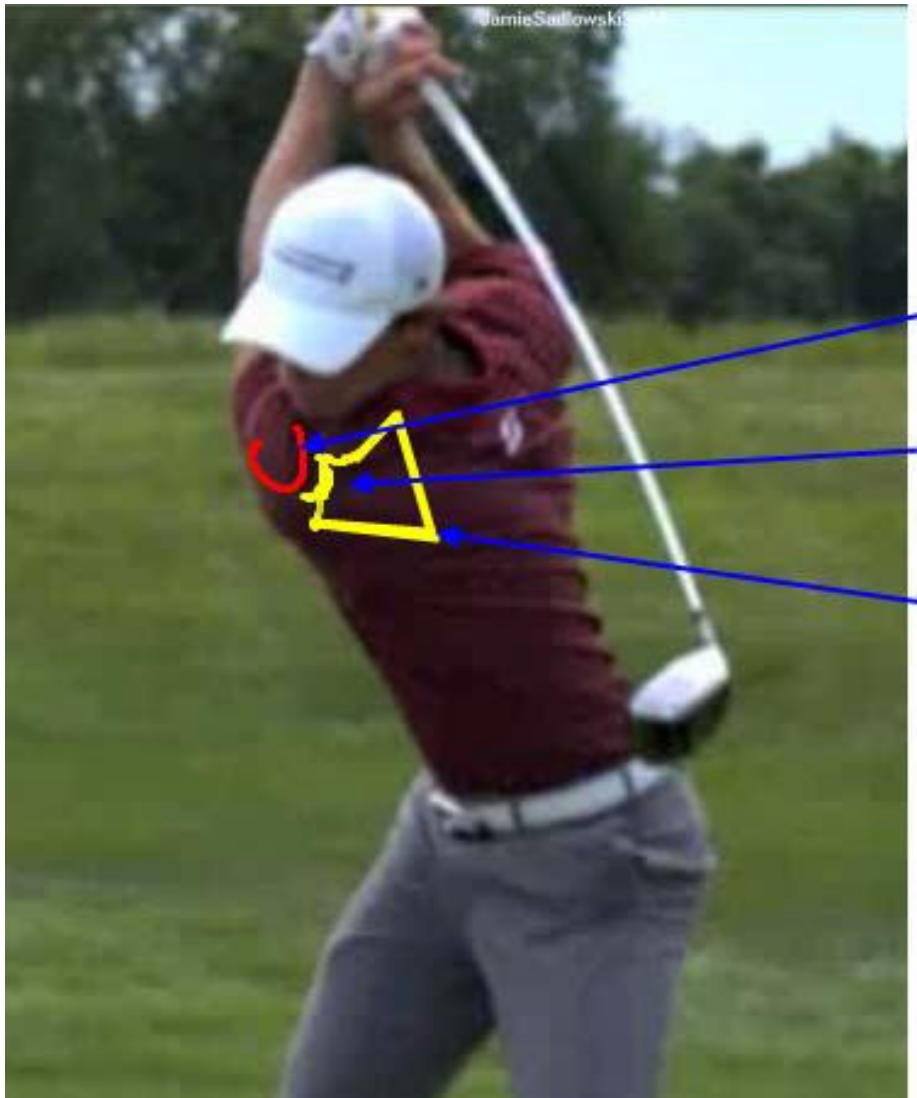
SELANNE
8
8
Horton
BAUER

# FEMORAL-ACETABULAR JOINT (HIP)

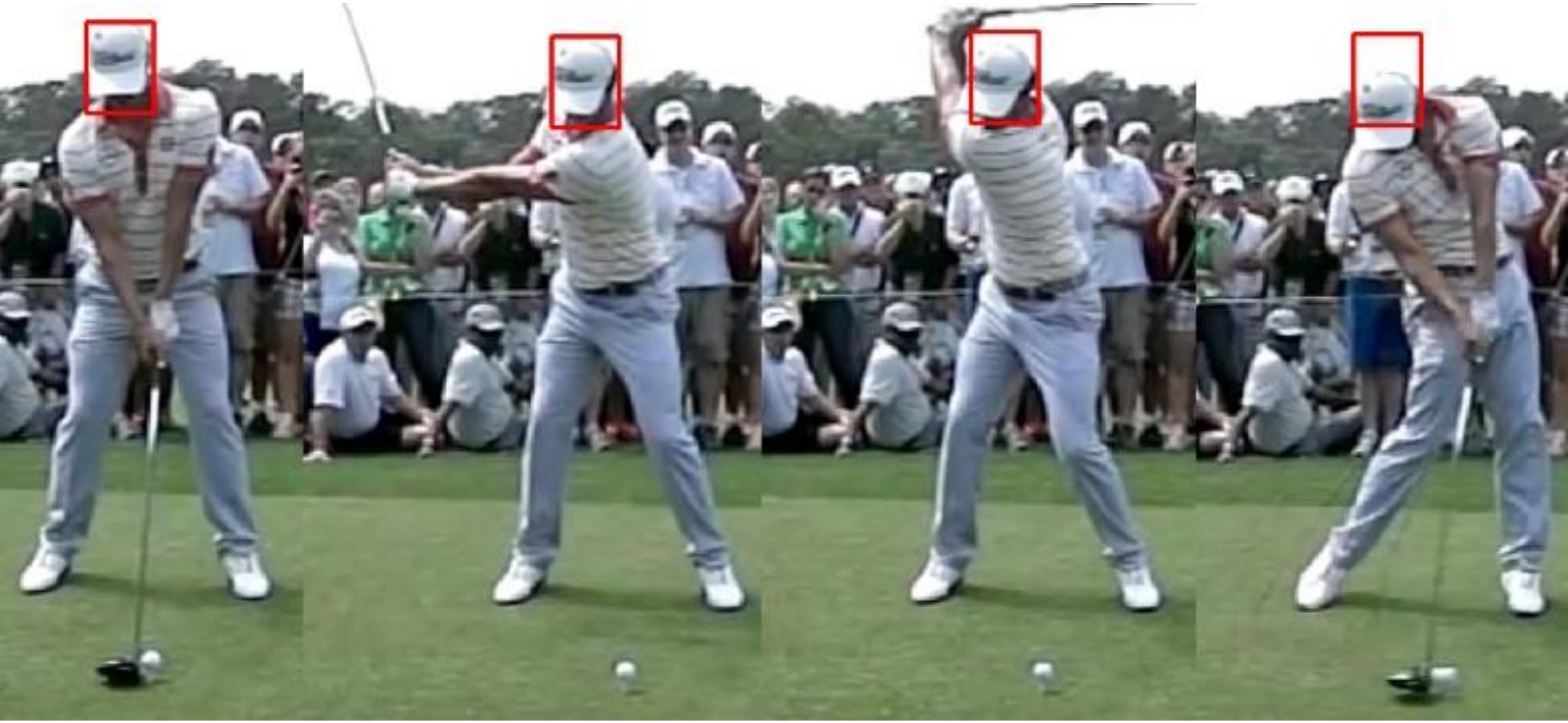


# THORACIC SPINE/RIB-CAGE

# GH JOINT/SCAPULA



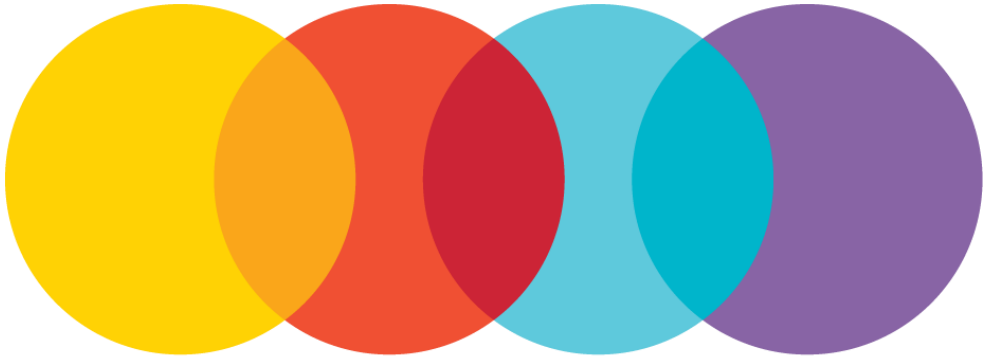
# CERVICAL SPINE/THORACIC SPINE



# ASSESSMENT & TREATMENT

# OUR ROLE

- ASSESSMENT
- MANIPULATION
- MOBILIZATION
- SOFT TISSUE TREATMENT
- REHABILITATION
- STRENGTH AND CONDITIONING



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