

NSCA

COACHES

CONFERENCE 2023

JANUARY 4 – 6, 2023

Charlotte, NC & Online | 2.0 CEUs

#NSCACoaches23

CONFLICT OF INTEREST STATEMENT

I have no actual or potential conflict of interest in relation to this presentation.



Jon Lynch, MS, CSCS, RSCC
Navigating the Sympathetic Threshold in Resistance Training



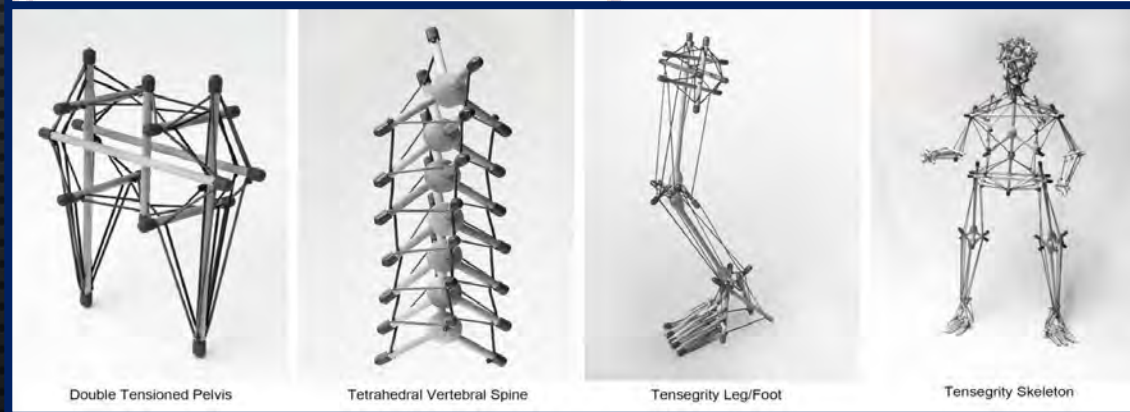
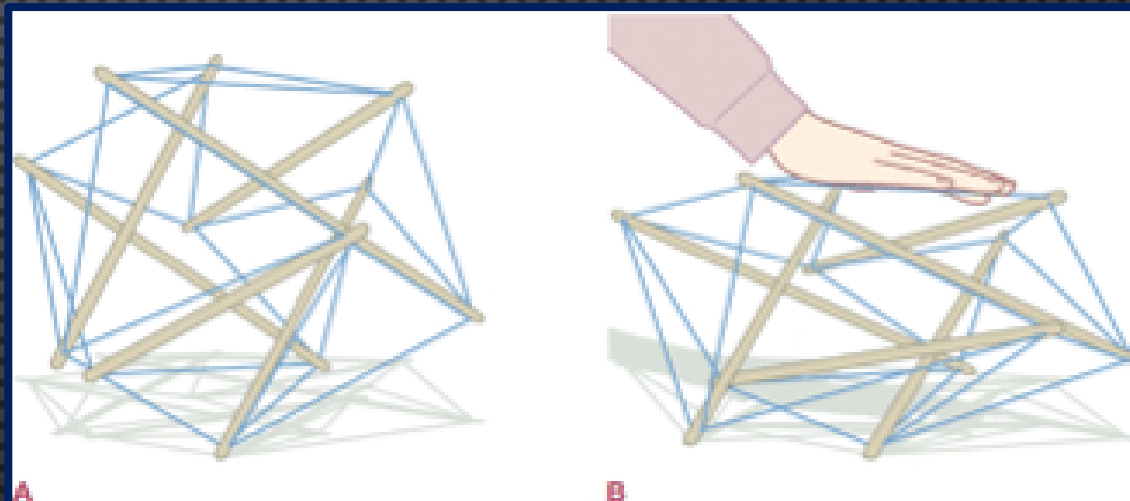
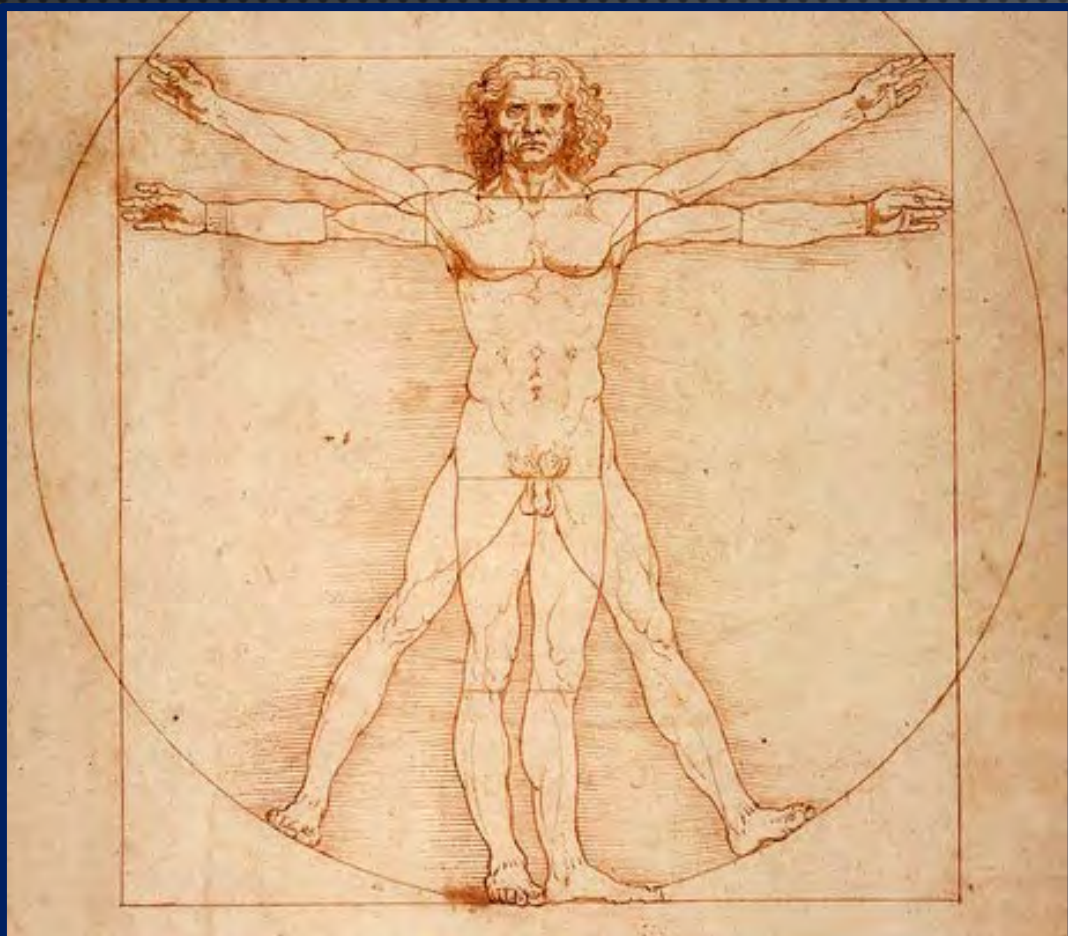
NAVIGATING THE SYMPATHETIC THRESHOLD IN RESISTANCE TRAINING

KEY CONCEPTS

Biotensegrity
Stress Management
Training Integration

KEY CONCEPT 1
BIOTENSEGRITY

ARCHITECTURAL MODEL OF TENSION/COMPRESSION APPLIED TO BIOLOGY
(FULLER, 1975) (MYERS, 2009)



FUNCTIONAL ANATOMY

- 1) BRAIN SIGNALS MUSCLE TO CONTRACT
- 2) MUSCLES PULL ON BONES
- 3) DICTATE POSTURE AND MOVEMENT

IS MUSCLE TIGHTNESS A MYTH?

- **CONCENTRICALLY LOADED** – LOCKED SHORT
- **ECCENTRICALLY LOADED** – LOCKED LONG



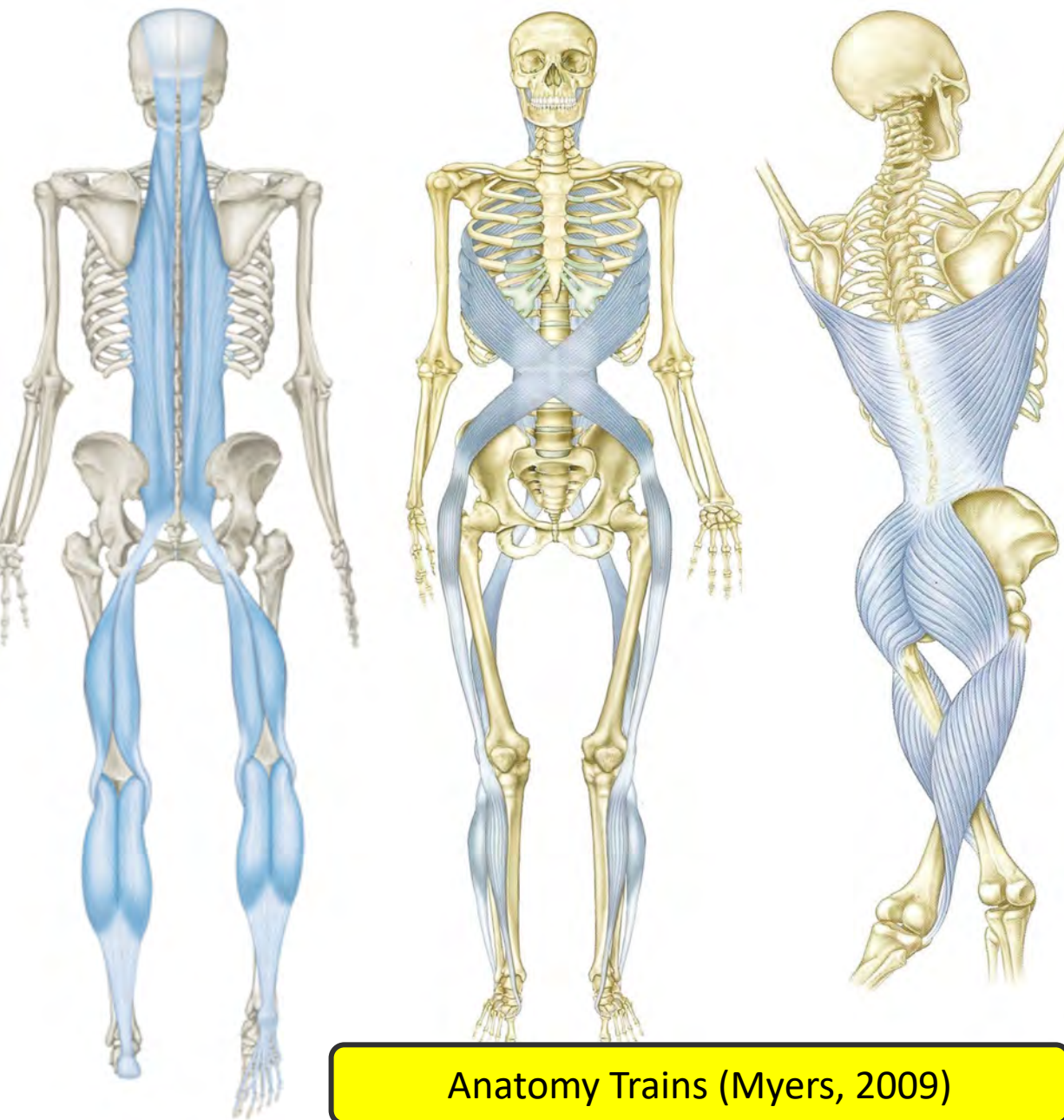
FUNCTIONAL ANATOMY

POLYARTICULAR MUSCLE CHAINS

- COMPRISED OF MUSCLE AND FASCIA
- TENSION AFFECTS THE ENTIRE CHAIN

MAJOR IMPLICATIONS:

- 1) AFFECT ALL 3 PLANES OF MOTION
- 2) INTERSECT ALL MAJOR JOINTS
- 3) PROFICIENCIES DICTATE DEFICITS
- 4) SPORT PATHOLOGY



Anatomy Trains (Myers, 2009)

KEY CONCEPT 2: STRESS MANAGEMENT

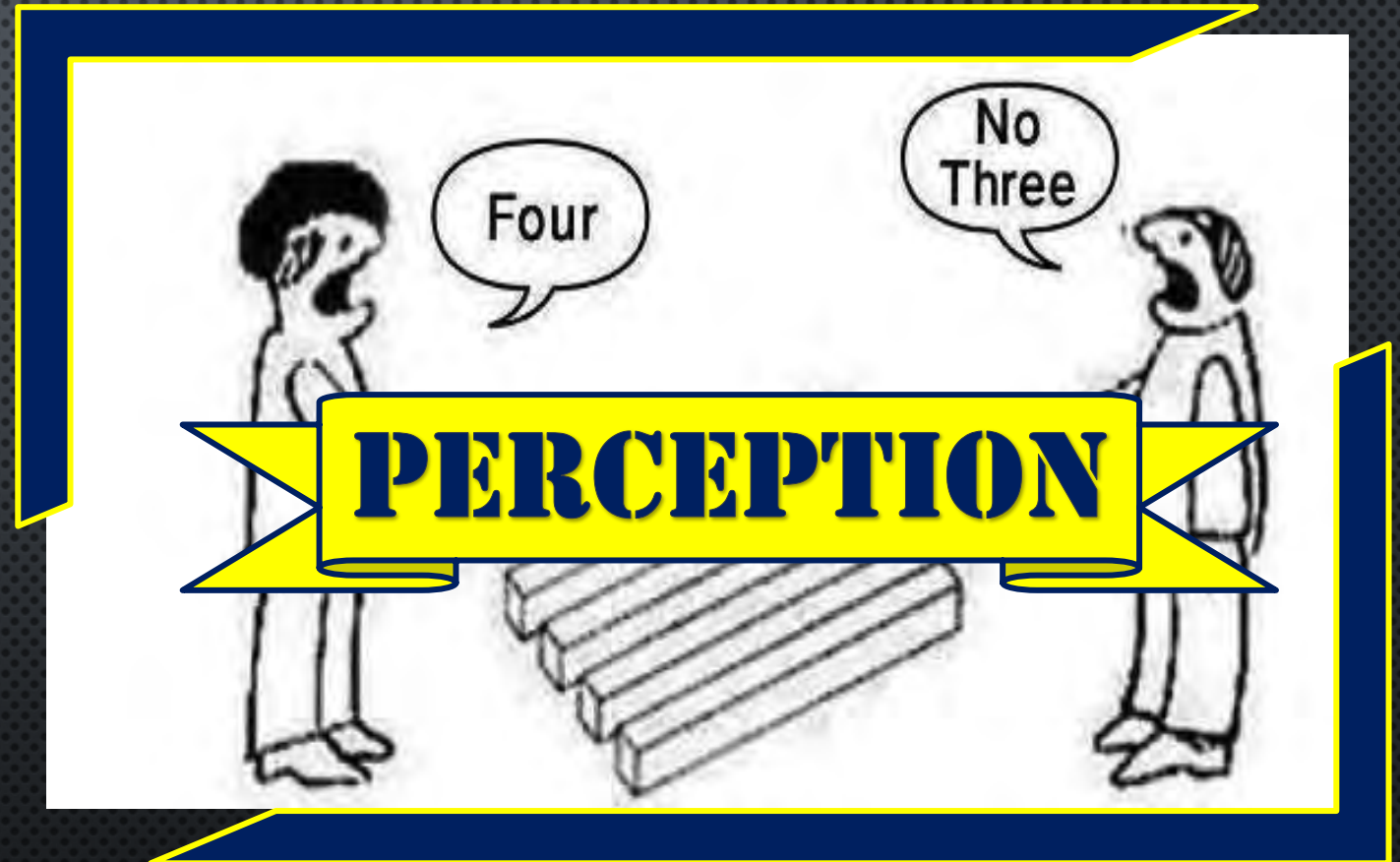
Performance Training is the intentional implementation of stressors to improve athletic ability

A STRESSOR IS:

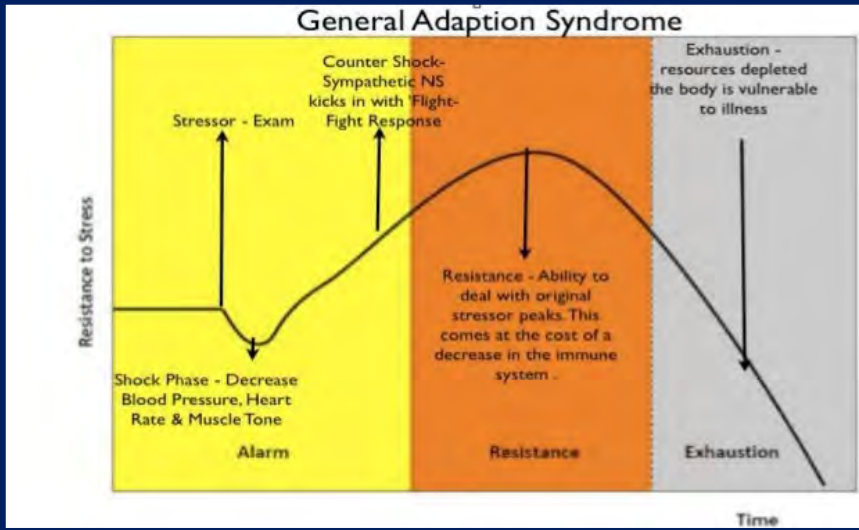
- ANY INPUT RECEIVED BY THE BRAIN:
 - ALL SENSES
 - ANY DISRUPTION IN THE HOMEOSTASIS OF THE BODY

“MUSCULAR TENSION AND EMOTIONAL TENSION IN THE BODY ARE ONE IN THE SAME”

- HAZLETT ET AL, 1994



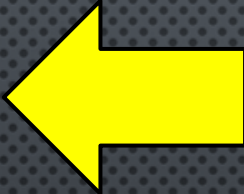
PHYSIOLOGICAL REACTIONS TO STRESS



GENERAL ADAPTATION SYNDROME

(SINGLE TRAINING IMPACT)

- PROCESS OF ADAPTATION
- READINESS
 - SELYE, 1946
- POSTURE

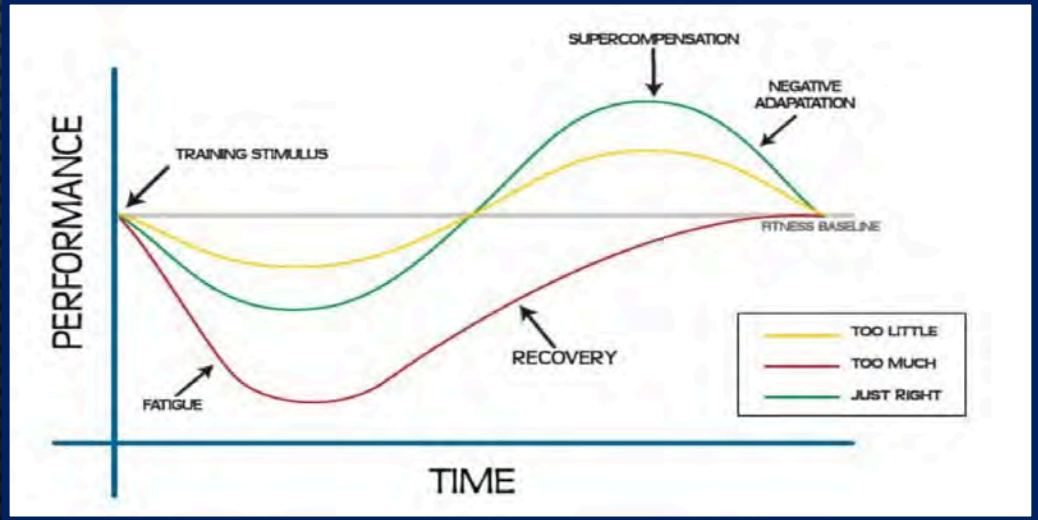
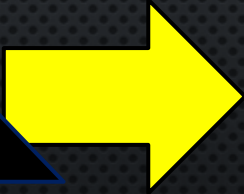


Supercompensation

Acute : Chronic Impact
10% Increase Weekly
Choose any metric

aptation

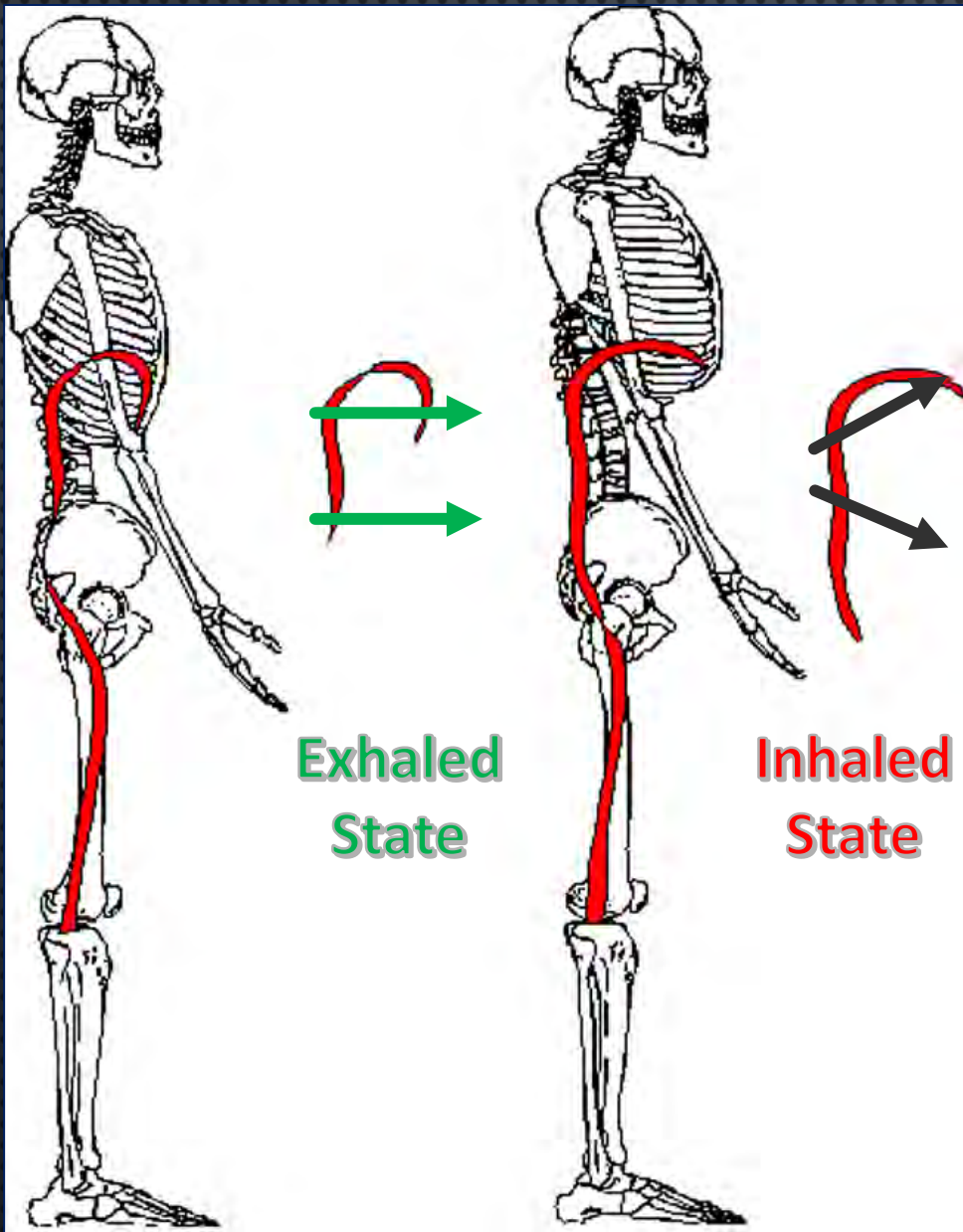
- Repeat loading @ Peak recovery*



FUNCTIONAL ANATOMY

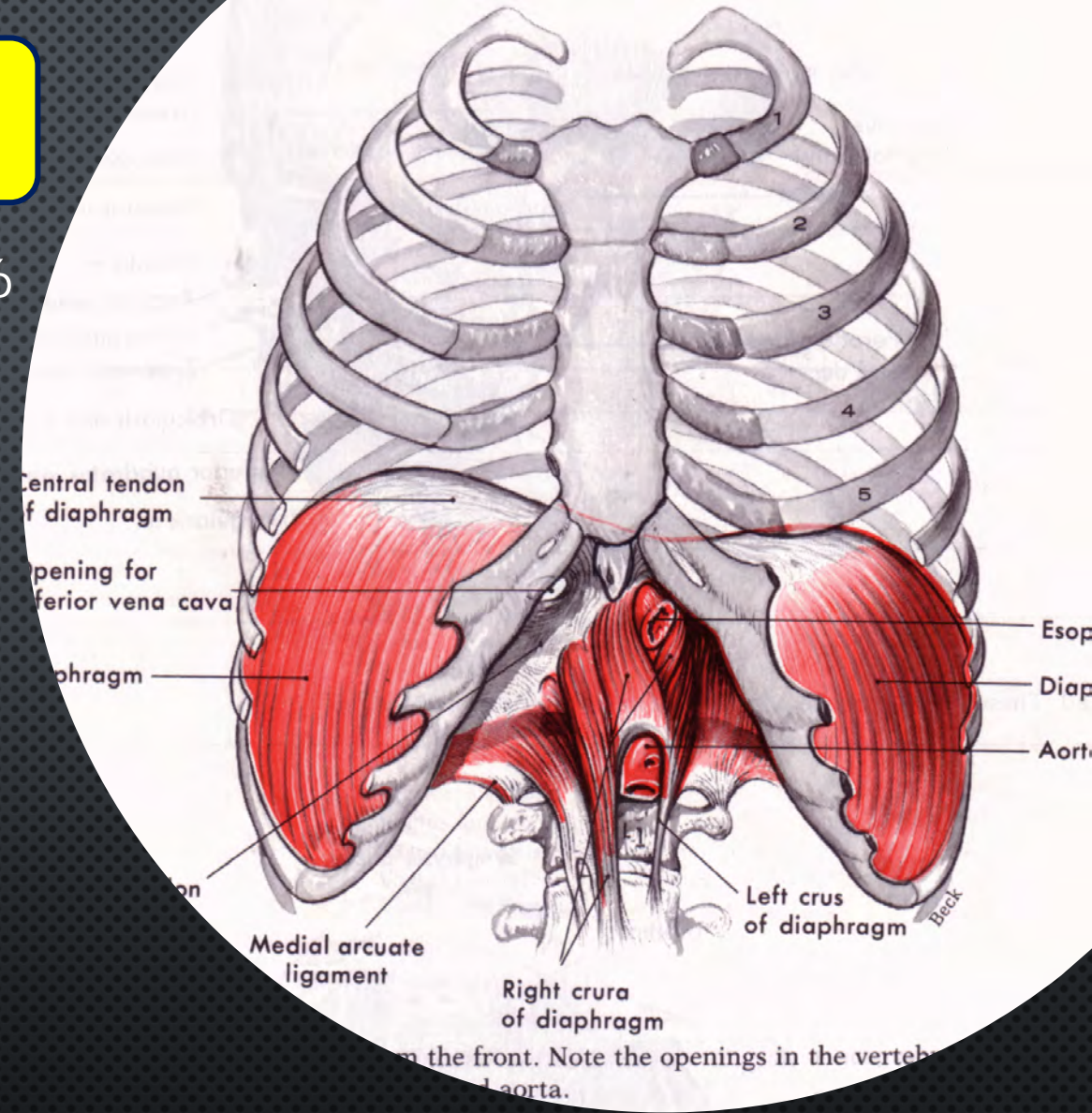
ZONE OF APPPOSITION: THE KEYSTONE OF THE BODY

- RESPIRATORY DIAPHRAGM
- PELVIC DIAPHRAGM
- ABDOMINAL WALL
 - INTERNAL OBLIQUE
 - EXTERNAL OBLIQUE
 - TRANSVERSE ABDOMINIS
 - SERRATUS ANTERIOR
- CONTROLLING THE ZOA GRANTS ACCESS TO NON-COMPENSATORY TRAINING STRATEGIES
 - BELOW NEURAL THRESHOLD



FUNCTIONAL ANATOMY

- SYMPATHETIC MUSCLE ACTIVATION - SAITO ET AL, 1986
 - SPINAL ERECTORS, UPPER TRAP, SCALENE, ETC.
- COMPENSATED RESPIRATION OCCURS AS A SYMPATHETIC RESPONSE TO STRESS
 - NON-DIAPHRAGMATIC
- RESPIRATORY DIAPHRAGM
 - POSTURAL STABILIZER
 - ORGAN DISPLACEMENT
 - LEFT LUNG : RIGHT LUNG – 2:3



MOVEMENT VARIABILITY

“MOVEMENT VARIABILITY IS THE NORMAL VARIATION THAT OCCURS IN MOTOR PERFORMANCE ACROSS MULTIPLE REPETITIONS OF A TASK.”

-VALLE, 2019

NEURAL THRESHOLD

- Ability to resist a stressor
- Function of Strength x Endurance

ENERGY SYSTEM IMPLICATIONS

KEY = Pennation Angle

- TYPE II  Improve Endurance
- TYPE I  Improve Power Output

KEY CONCEPT 3:

TRAINING INTEGRATION

Intent: applying the proper stressor in order to get the desired adaptation

TRAINING WITH INTENT – 2 TYPES OF IMPACT

- STRENGTH AND ENDURANCE
- SPEED AND POWER

BELOW NEURAL THRESHOLD

- STRENGTH MOVEMENTS – ALL NON-EXPLOSIVE LIFTS
- RECOVERY METHODS – YOGA, BREATHING TECHNIQUES

ABOVE NEURAL THRESHOLD

- SPORT PRACTICE – SPRINTING, CUTTING, PHYSICAL CONTACT
- POWER MOVEMENTS – SNATCH, CLEAN, JERK, JUMPING, THROWING
- ***MAXIMAL STRENGTH TRAINING***

BALANCE

BASE LEVEL CORE TRAINING



Intent Checklist:

1. Z. O. A.
Pressure
2. Postural
Stability
3. Intentional
Breaths
4. Torque

SUB NEURAL THRESHOLD

ABOVE NEURAL THRESHOLD

Explosive Exercise Clean Variations

Coaching Points:

- Braced pull emphasizing speed
- Explosive triple extension
- Violent shrug back (1")
- Punch elbows (Forward)
- Brace to accept load

Movement Variability Application:

- Ability to perform effectively brace, extend, and re-brace to accept load

SUB NEURAL THRESHOLD

ABOVE NEURAL THRESHOLD

Strength Exercise Horizontal Press

Coaching Points:

- Reach up prior to rep
- Brace core – back/hips on bench
- Elbows in and toward hip
- Do not shrug or press overhead
- Ribs down during press

Movement Variability Application:

- Ability to maintain bracing position throughout multiple reps, regardless of intensity.

SUB NEURAL THRESHOLD

ABOVE NEURAL THRESHOLD

Strength Exercise Horizontal Pull Variation

Coaching Points:

- Brace core – Anti-Extension
- Elbows in and toward hip
- Do not shrug or thrust
- Ribs down during press
- SA* - Rotational Rib Emphasis

Movement Variability Application:

- Ability to maintain bracing position throughout multiple reps, regardless of intensity.

SUB NEURAL THRESHOLD

ABOVE NEURAL THRESHOLD

Strength Exercise Vertical Pull Variation

Coaching Points:

- Brace core – Anti-Extension
- Head through, full reach
- Elbows in and toward hip
- Down-shrug mid rep (long neck)
- Ribs down throughout rep
- SA* - Rotational Rib Emphasis

Movement Variability Application:

- Ability to maintain bracing position throughout multiple reps, regardless of intensity.

ASSISTANCE EXERCISE VARIATIONS



Jon Lynch, MS, CSCS, RSCC
Navigating the Sympathetic Threshold in Resistance Training



Capacity + Willpower



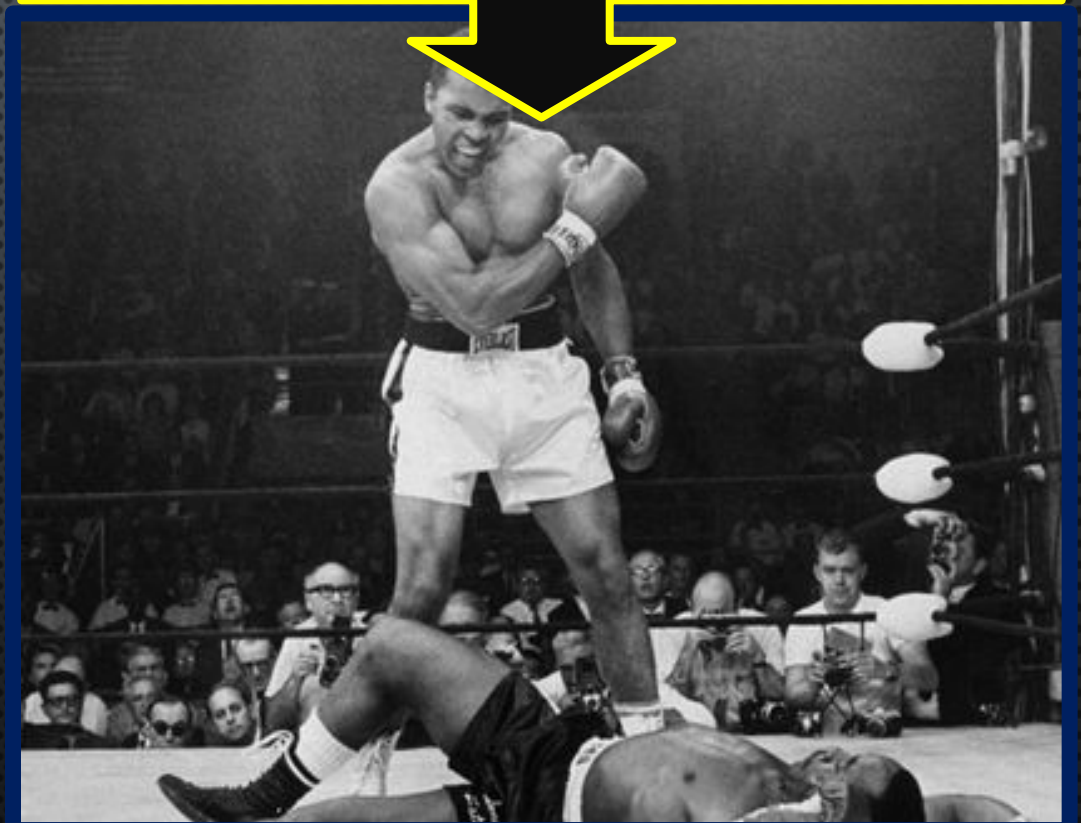
Neural Threshold



“You must be shapeless, formless, like water. When you pour water in a cup, it becomes the cup. When you pour water in a bottle, it becomes the bottle. When you pour water in a teapot, it becomes the teapot. Water can drip and it can crash. Become like water my friend.”

FLOAT LIKE A BUTTERFLY (OXIDATIVE)

STING LIKE A BEE (PHOSPHAGEN)



Take Home

- TRAINING PROFICIENCY IS A FUNCTION OF COMPLEXITY
 - COMBINATION OF : RELATIVE INTENSITY, SPEED, AND INTENT
- SAID PRINCIPLE - GET IT RIGHT, NOW
 - IF IT LOOKS BAD AT LIGHT WEIGHT, IT'LL LOOK WORSE AT HEAVIER WEIGHT
- THE GOAL IS TO BE BETTER AT THE SPORT!
 - TRAINING MUST TRANSFER TO THE FIELD

Contact:

Email - jonathan.lynch@maine.edu

Phone - 413-535-7352

Twitter - @JLynchSPC

Instagram - @blackbearssp

WORKS CITED

- HAZLETT, R, MCLEOD, D, HOEHN-SARIC, R. MUSCLE TENSION IN GENERALIZED ANXIETY DISORDER: ELEVATED MUSCLE TONUS OR AGITATED MOVEMENT? *PSYCHOPHYSIOLOGY* MARCH, 1994, VOL. 31 ISSUE 2, p189.
- LARUSEN, P, BUCHHEIT, M. SCIENCE AND APPLICATION OF HIGH INTENSITY INTERVAL TRAINING: SOLUTIONS TO THE PROGRAMMING PUZZLE. *HUMAN KINETICS*, CHAMPAIGN, IL 2019. p.381
- MYERS, T. ANATOMY TRAINS: MYOFASCIAL MERIDIANS FOR MANUAL MOVEMENT THERAPISTS, 2ND ED. CHURCHILL LIVINGSTONE ELSEVIER, LONDON 2009.
- SAITO, M, ET AL. RESPONSES IN MUSCLE SYMPATHETIC NERVE ACTIVITY TO SUSTAINED HAND-GRIPS OF DIFFERENT TENSIONS IN HUMANS. *EUROPEAN JOURNAL OF APPLIED PHYSIOLOGY & OCCUPATIONAL PHYSIOLOGY* 1986: VOL. 55 ISSUE 5. P. 493-498.
- SELYE, H. THE GENERAL ADAPTATION SYNDROME AND THE DISEASES OF ADAPTATION. *THE JOURNAL OF CLINICAL ENDOCRINOLOGY*, VOLUME 6, ISSUE 2, 1 FEBRUARY 1946, p117-230.
- VALLE, C. 5/17/2019. MOVEMENT VARIABILITY – CONNECTING STRATEGIES, ERRORS, AND INTERVENTIONS. RETRIEVED FROM URL:[HTTPS://SIMPLIFASTER.COM/ARTICLES/MOVEMENT-VARIABILITY-STRATEGIES-INTERVENTIONS/](https://simplifaster.com/articles/movement-variability-strategies-interventions/)
- WÆRSTED , M, HANVOLD, T, VEIERSTED, K. PERCEIVED TENSION AND RELAXATION ABILITY IN YOUNG ADULTS. *EUROPEAN JOURNAL OF PHYSIOTHERAPY*. MAR2013, VOL. 15 ISSUE 1, p18.
- FULLER, R, B, APPLEWHITE, E, J. SYNERGETICS: EXPLORATIONS IN THE GEOMETRY OF THINKING. MACMILLAN PUBLISHING Co. 1975.