

ADVANCED CORE TRAINING & CONDITIONING



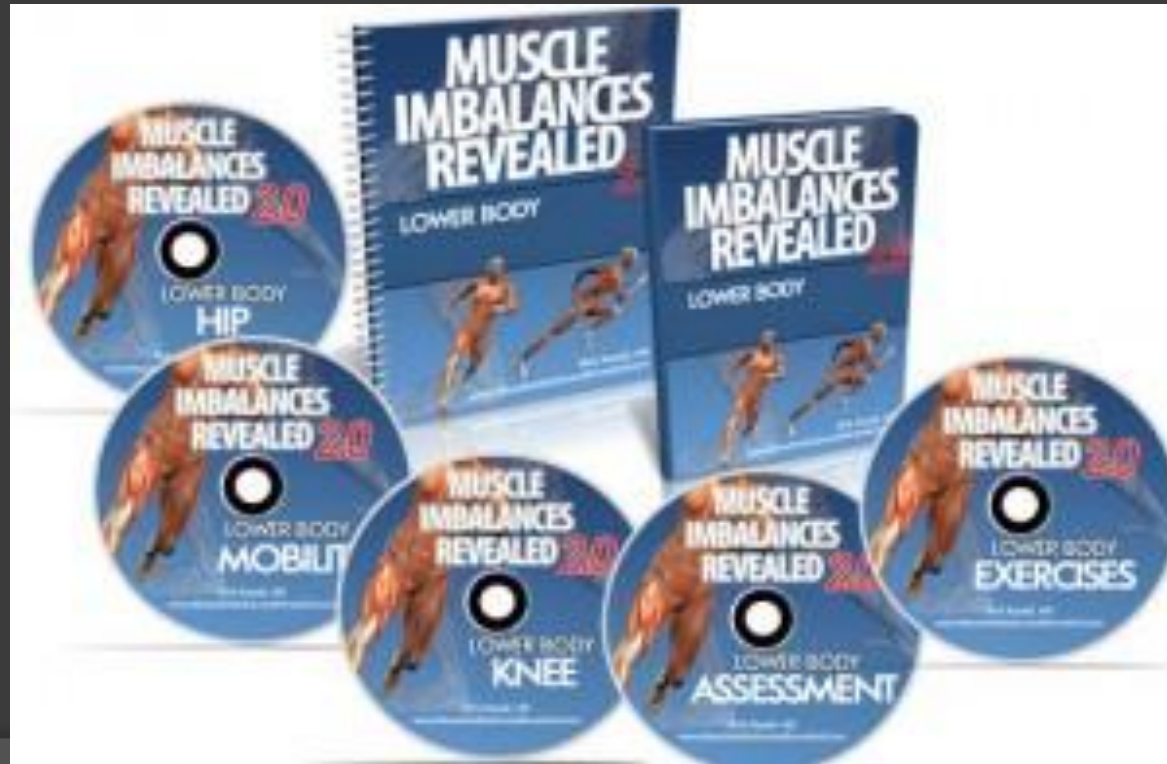
Dean Somerset
BSc. Kinesiology, CSCS, MES

Today's Webinar will....

- Show you that core training is more than just crunches
- Go through how the core works, in normal situations and also in pain
- Come up with some ways to train the core that most trainers tend to miss
- Develop an action plan for your workouts so they train the core for both Show and for GO!!

Quick Promo!!!

Check out Muscle Imbalances Revealed: Lower Body for more awesome presentations!!



Allow Myself to Introduce.....Myself

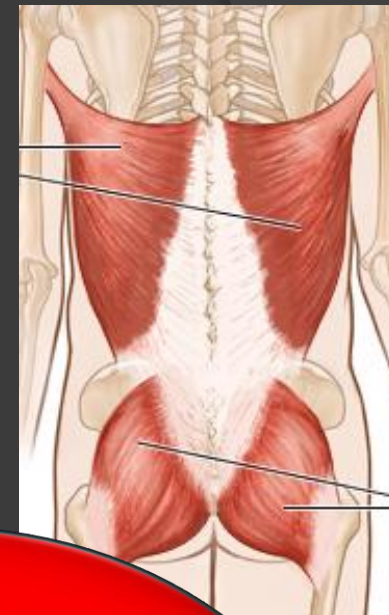
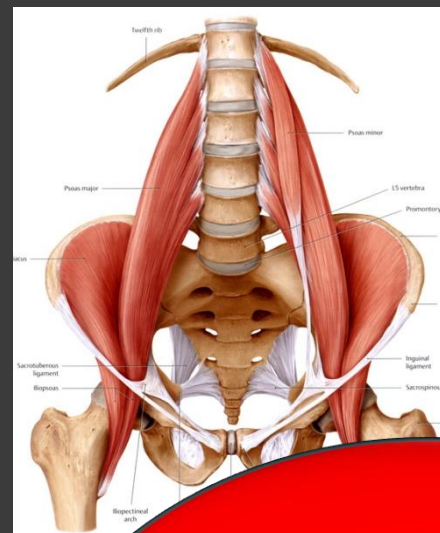
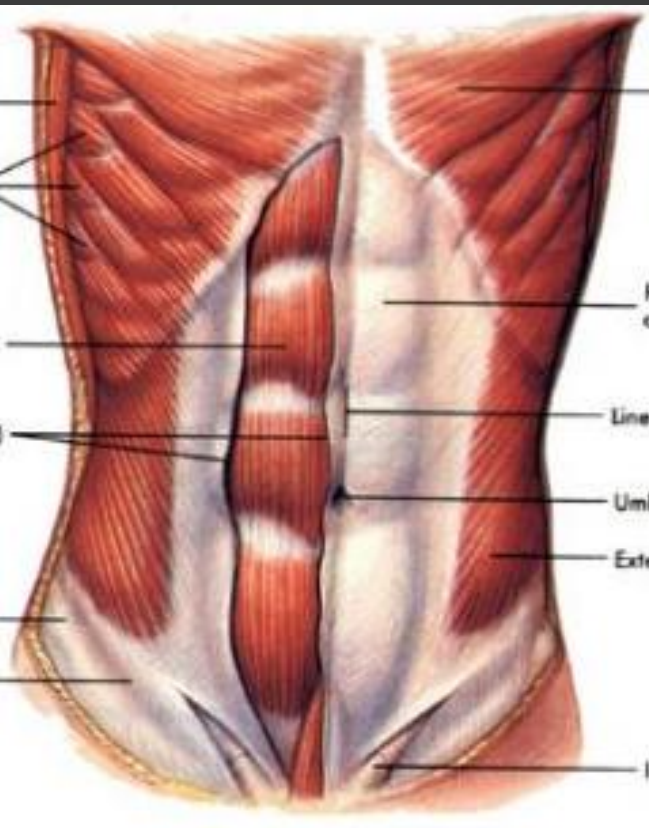
- BSc. Kinesiology, University of Alberta
- CEP - CSEP
- CSCS – NSCA
- MES – AAHFRP
- Medical & Rehabilitation Coordinator, World Health
- Clientele range from pre-post surgical, MVA, cancer patients, up to athletes & “weekend warriors”
- Written articles for T-Nation, ThePTDC.com, and a few others



Imagine Your Core is This Guy...

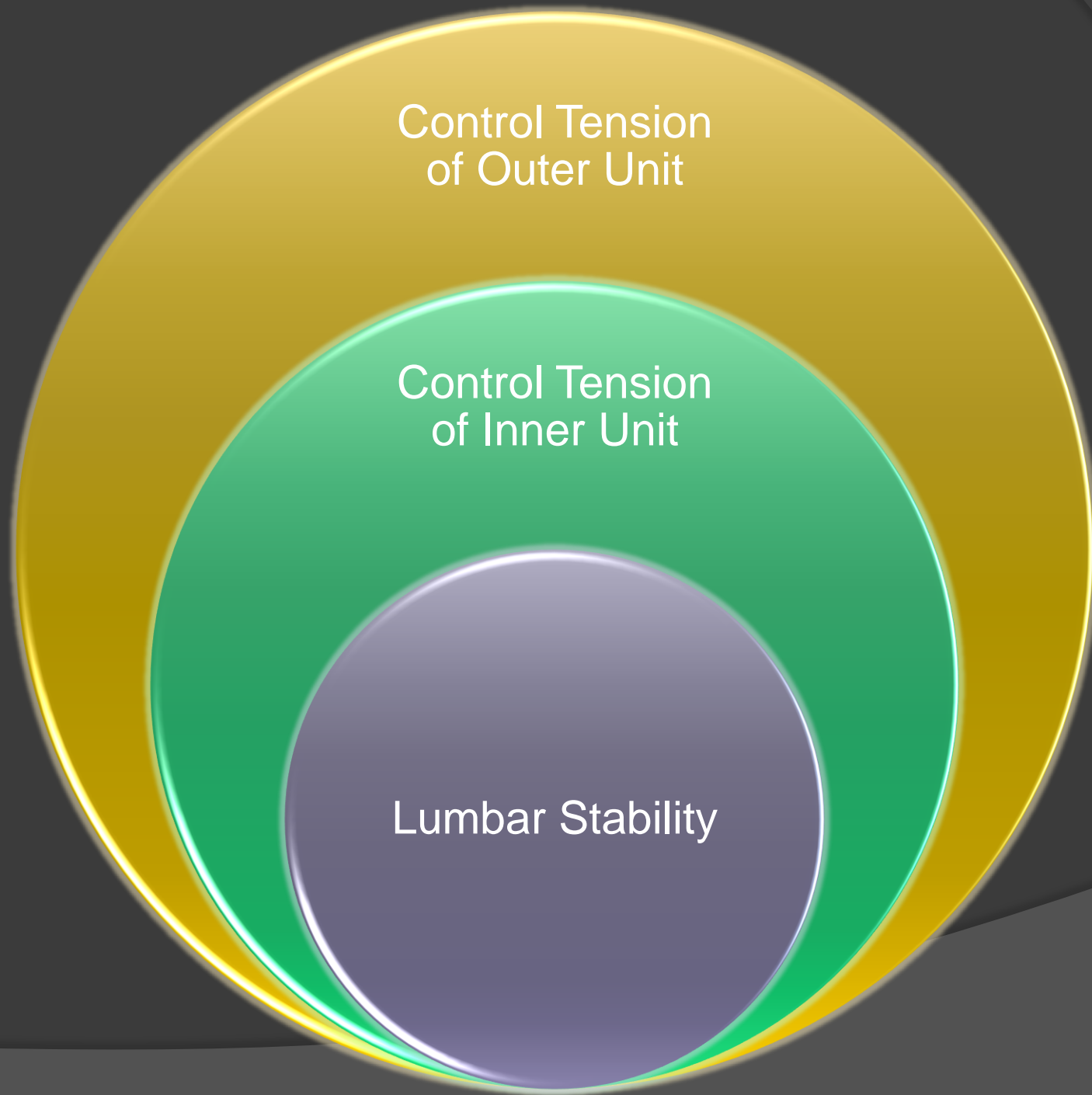


What is the Core??



What is the Core??

- Common belief of “inner core” and “outer core”
- Inner core – diaphragm, pelvic floor, TvA, multifidus
- Outer core – QL, ROE, ROI, rectus abdominis
- Popularized by Panjabi et al (1992), picked up in book *Therapeutic Exercise for Spinal Segmental Stabilization in Low Back Pain*, referred to as “Australian Method”
- Forgets to include latissimus dorsi, iliopsoas, transversari, spinalis, glutes, thoracolumbar & intraabdominal fascial sheaths.....



Control Tension
of Outer Unit

Control Tension
of Inner Unit

Lumbar Stability

What is the Core??

- Australian Method:
- Belief that TvA is major influencer of spinal stability
- by activating it through a “drawing in” motion of abdomen it can influence multifidus function and increase spinal stability



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What is the Core??

- McGill Model
- Popularized by Dr. Stuart McGill in *Low Back Disorders*
- Says that drawing in disrupts natural mechanics of core, and can lead to more instability.
- “Bracing” of the abdomen (contracting everything equally to resist deformation) gives the best stability, increases compression and reduces shear force to spare lumbar spine

What is the Core??

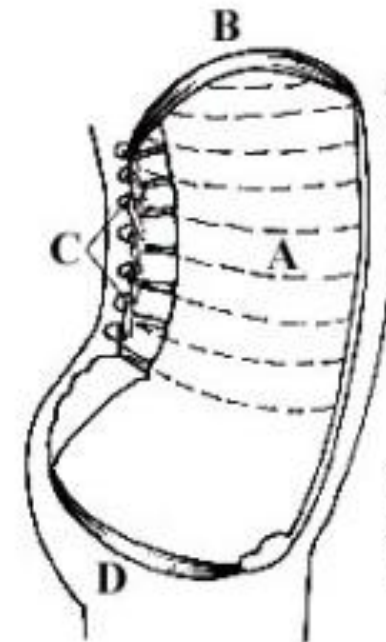
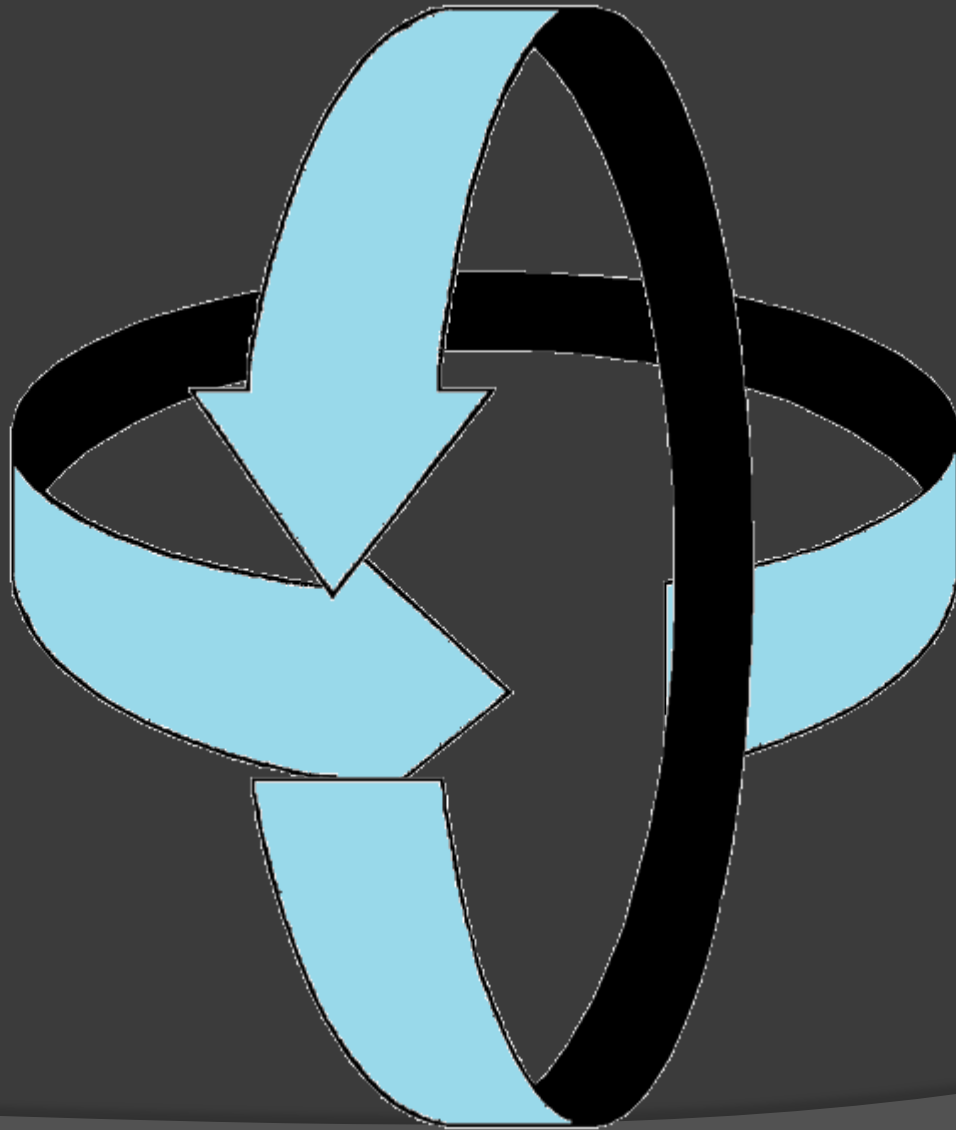
TABLE 2. Average peak muscle activation for the trunk and selected hip and thigh muscles recorded during all strongman events (the case study of the KWRS, KWLS, and SL are included).

Event		Muscle															
		RRA	LRA	REO	LEO	RIO	LIO	RLD	LLD	RUES	LUES	RLES	LLES	RGMED	RGMAX	RBF	RRF
FW	Mean	13.3	20.6	50.4	39.3	110.8	80.9	151.7	169.2	91.4	77.6	143.5	105.8	108.4	114.1	54.0	77.4
	SD	3.8	12.6	17.4	30.6	33.0	26.9	26.7	55.4	54.7	29.3	36.7	51.1	66.9	70.3	13.7	35.6
RHSC	Mean	5.6	21.2	29.0	61.5	62.6	47.3	91.4	68.9	52.1	32.4	44.1	77.4	57.3	50.5	48.3	56.5
	SD	1.8	14.6	17.8	21.9	26.8	45.3	39.1	23.2	17.3	4.6	9.1	21.3	23.6	31.2	8.6	11.4
LHSC	Mean	14.6	6.3	65.1	12.6	51.9	31.5	65.3	97.4	24.9	47.1	96.9	31.6	64.1	78.2	31.2	41.1
	SD	4.5	2.2	24.4	5.3	41.5	4.6	6.2	55.7	17.6	6.2	20.4	10.1	38.7	39.5	7.5	9.2
YW	Mean	22.3	32.5	58.8	47.5	128.3	52.6	45.5	51.9	65.6	69.3	107.4	79.2	108.1	113.0	61.7	106.9
	SD	19.1	22.7	29.1	31.7	21.7	40.9	31.7	26.4	14.4	17.5	31.5	10.2	69.7	52.1	6.3	23.5
LL	Mean	27.3	29.1	61.5	49.6	98.1	91.3	146.2	179.7	128.0	135.7	161.7	93.0	156.1	157.6	73.2	100.2
	SD	27.8	12.4	49.1	27.9	44.0	30.6	90.8	102.2	87.6	87.0	92.8	37.6	163.9	147.1	26.4	69.5
TF	Mean	87.8	69.3	106.6	80.5	141.5	97.6	227.2	237.8	118.1	100.3	236.2	157.7	179.8	200.4	90.7	154.5
	SD	63.9	70.6	45.4	12.2	54.6	34.1	145.4	84.1	47.2	21.1	72.2	31.0	75.6	61.5	7.2	86.2
KWLS	Mean	30.5	45.6	73.6	87.0	105.4	85.3	57.1	108.1	102.3	72.2	114.3	84.6	87.5	64.5	70.0	53.4
	SD	14.8	42.8	62.2	46.0	14.3	36.9	35.4	17.4	67.3	36.8	26.5	16.3	31.9	7.0	25.8	29.4
KWRS	Mean	19.9	23.2	64.9	39.7	96.4	79.1	49.4	102.2	91.4	76.2	138.7	92.6	131.7	89.7	75.2	72.0
	SD	1.7	6.4	21.4	17.7	11.3	20.2	20.1	15.7	29.5	46.0	29.2	35.9	0.3	24.5	22.5	40.6
SL	Mean	77.6	76.8	97.6	103.6	102.0	117.5	109.3	148.9	131.8	154.7	226.0	137.3	288.6	259.1	85.4	176.8
	SD	41.6	24.7	67.7	2.5	63.0	67.3	37.5	58.6	77.1	36.4	81.0	30.9	131.6	154.9	7.8	52.1

FW = farmer's walk; RHSC = right-hand suitcase carry; LHSC = left-hand suitcase carry; YW = superyoke walk; LL = log lift; TF = tire flip; KWLS = keg walk-left shoulder; KWRS = keg walk-right shoulder; SL = Atlas stone lift; RRA = right rectus abdominis; LRA = left rectus abdominis; REO = right external oblique; LEO = left external oblique; RIO = right internal oblique; LIO = left internal oblique; RLD = right latissimus dorsi; LLD = left latissimus dorsi; RUES = right upper (thoracic) erector spinae; LUES = left upper (thoracic) erector spinae; RLES = right lumbar erector spinae; LLES = left lumbar erector spinae; RGMED = right gluteus medius; RGMAX = right gluteus maximus; RBF = right biceps femoris; RRF = right rectus femoris.

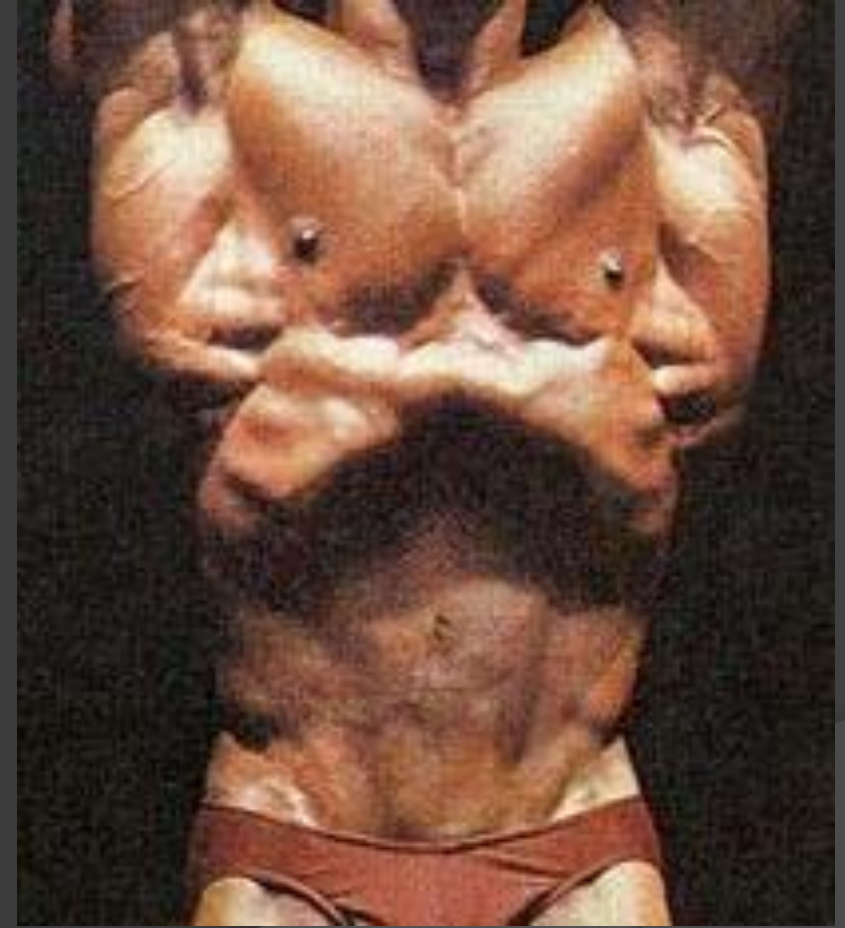


What is the Core??



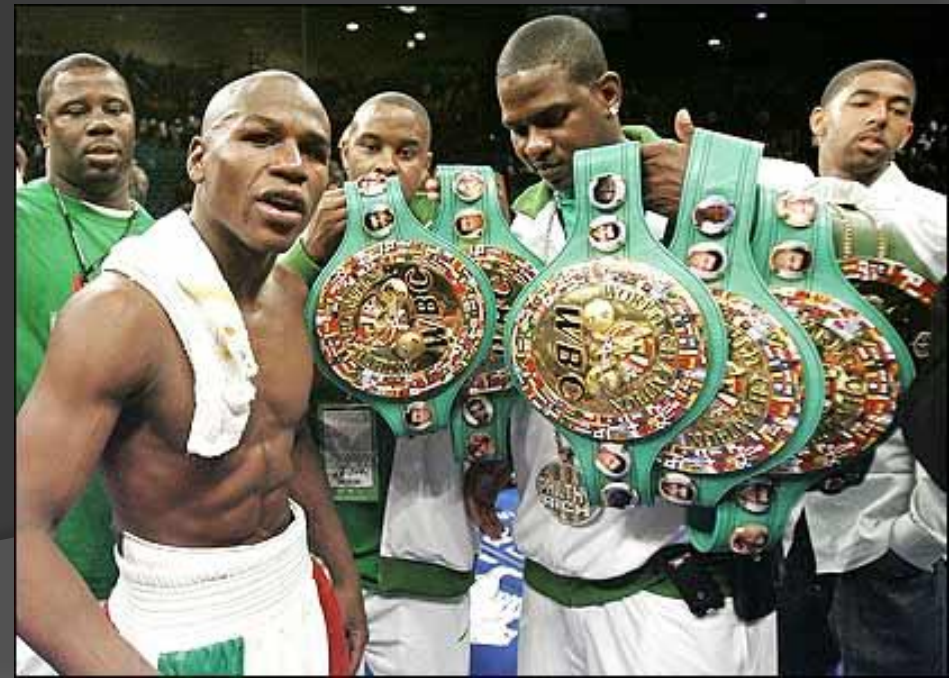
A = Transversus abdominis
B = Diaphragm
C = Multifidus
D = Pelvic floor muscles

What is the Core??



What is the Core??

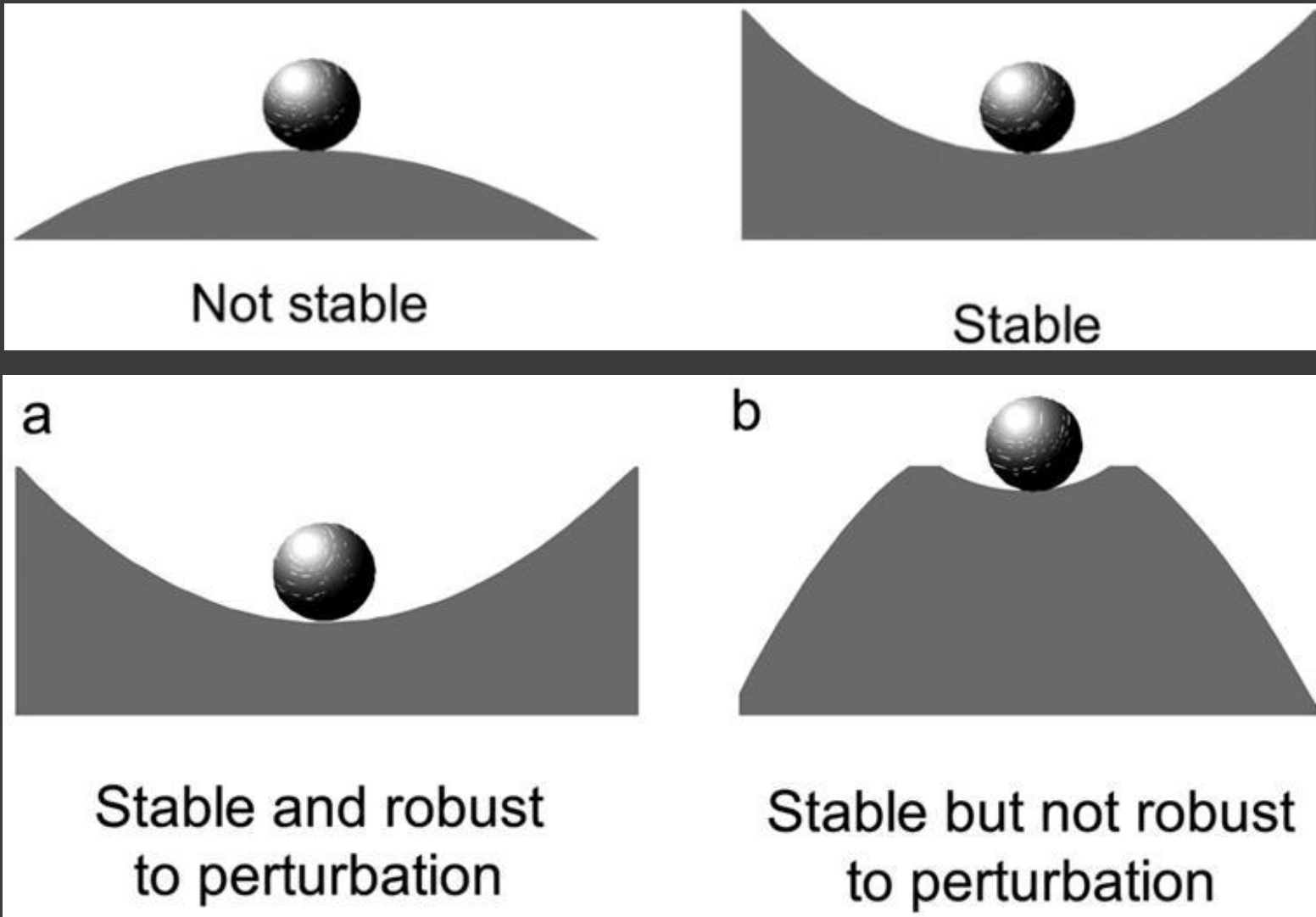
- Loosely defined – all muscles that control the movement of the pelvis and thoracic cage in relation to the lumbar spine
- More specific – Everything under the Champ-belt region



What the Hell Does it Do?

- More tonic than phasic in nature
- Most muscles that are easily injured have short moment arms, meaning they stabilize and resist spinal segmental motion
- 3 Main Functions:
 1. Allows transfer of force from arms to legs & vice versa
 2. Resists deformation of spine while allowing a high degree of movement from pelvis and shoulders
 3. Assists in breathing mechanics

Spinal Stability



Who has the Better Core??



Shane Hamman,
237.5 kg Clean & Jerk (US)

Usain Bolt:
9.58 seconds 100m (WR)
19.19 seconds 200m (WR)



Goeffrey Mutai
2011 Boston winner
2:03:02 (WR)



Young gymnast
Just plain weird

Who Has The Better Core??



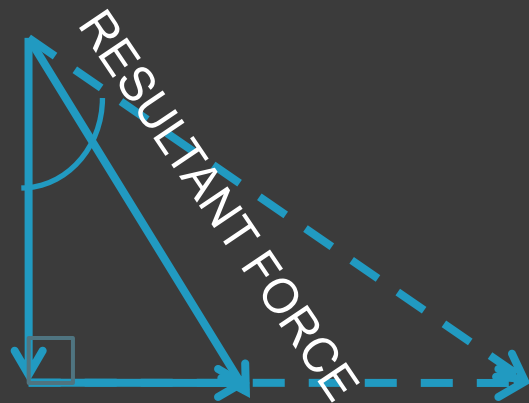
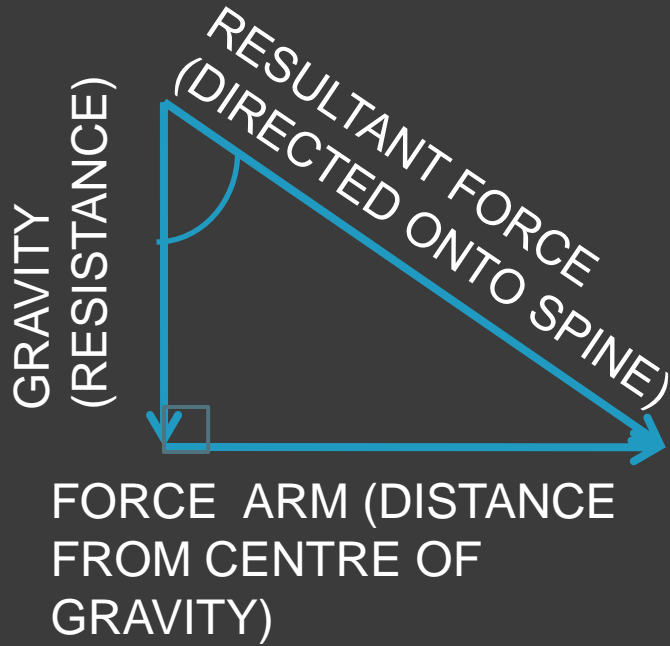
Who Has The Better Core??

- ◎ Core must be:
 - Stiff enough
 - Elastic enough
 - Deformable enough
 - Fatigue-resistant enough
- ◎ To do all the tasks asked of it.
- ◎ If it's not, it gets injured

Core Function and LBP

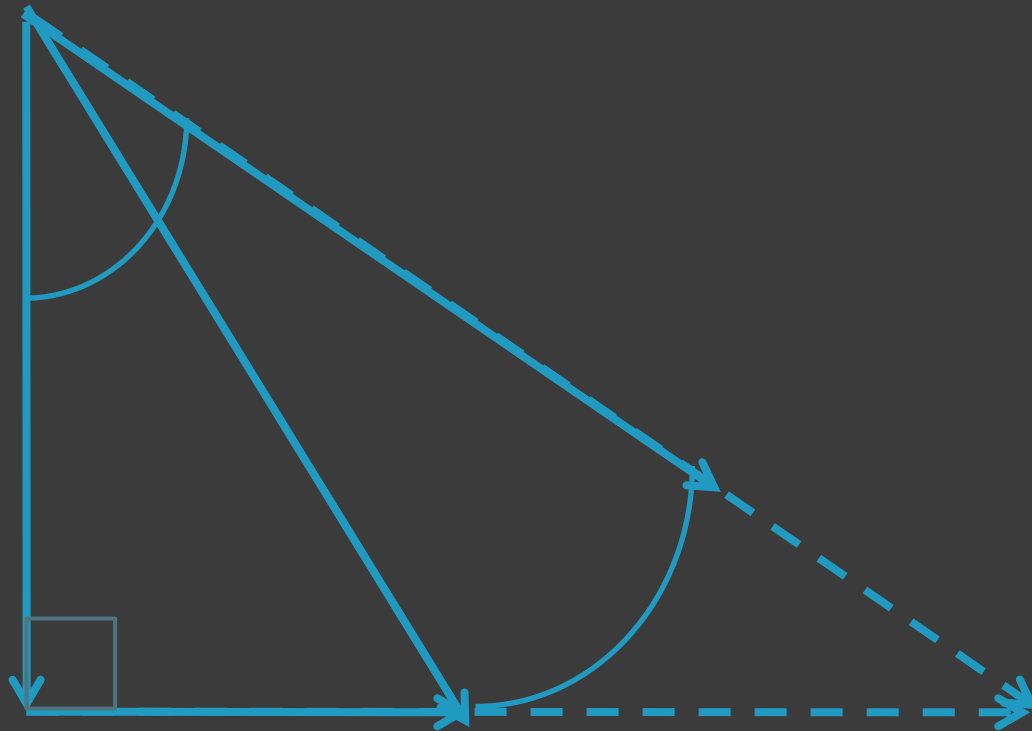
- With spinal instability, core muscles downregulated
→ specifically TvA and segment-specific multifidus
- Lack of muscle support leads to more instability, which leads to more pain and dysfunction
- End of pain does NOT mean normal core function is restored, just that threshold for pain hasn't been reached

Core Function and LBP



- With same resistance, the further the weight is from the centre of gravity, the greater the resultant strain on the low back
- Pelvic-spinal position, as well as distance of weight from body (spinal angle) contribute to low back strain when lifting

Core Function and LBP



- Forward bending with flexed spine, anterior pelvic tilt, or elevated/protracted shoulders increases pressure on spine

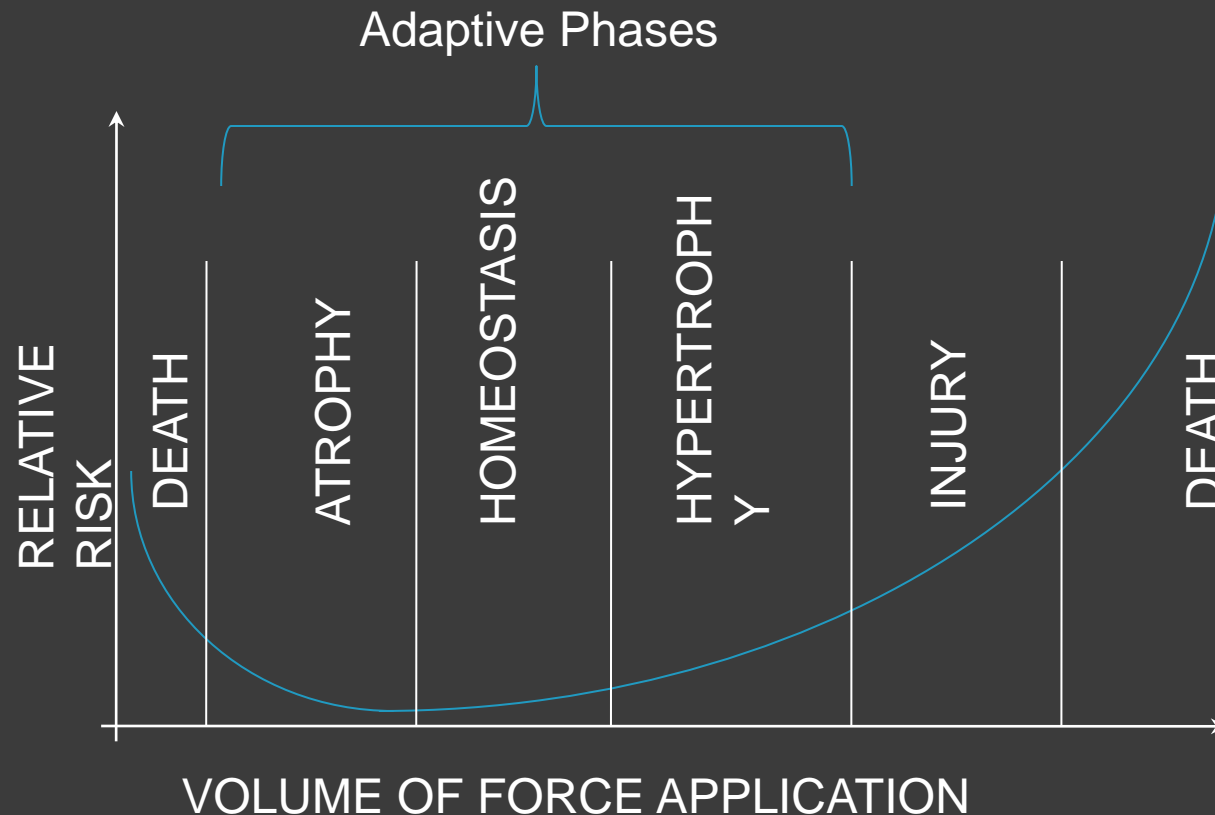


1,900 N Shear Loading



200 N Shear Loading

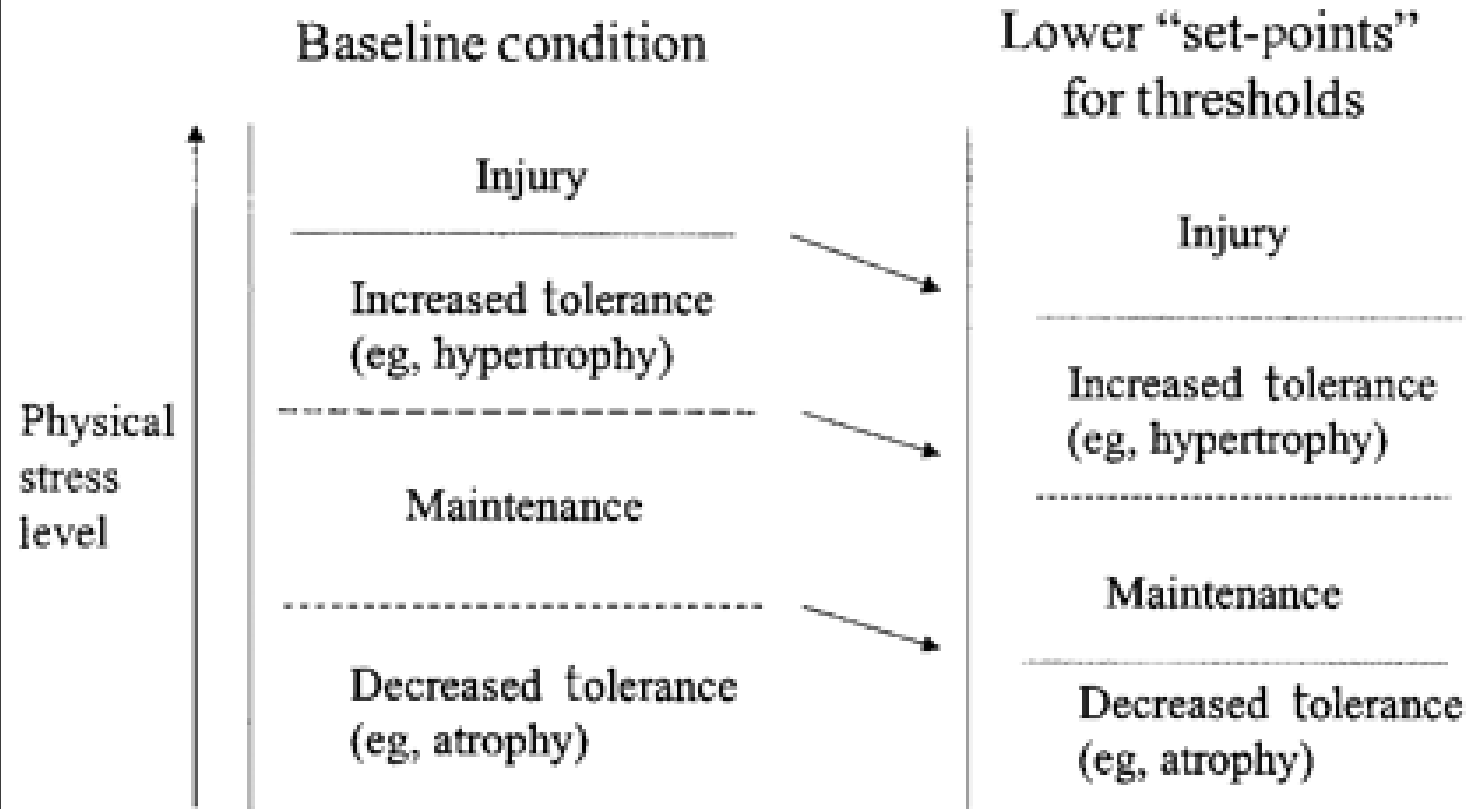
Repetitive Strain



*DEPENDENT
ON TIME,
MAGNITUDE,
AND
DIRECTION OF
FORCE
APPLICATION*

Repetitive Strain

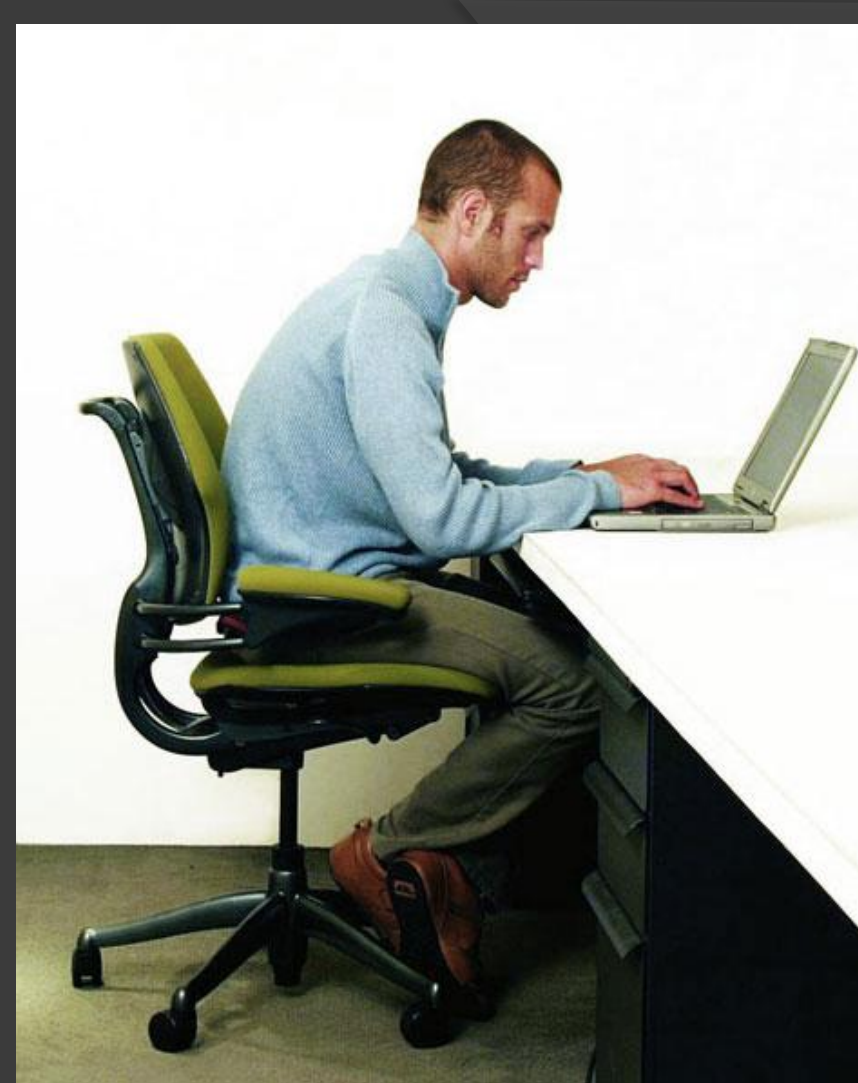
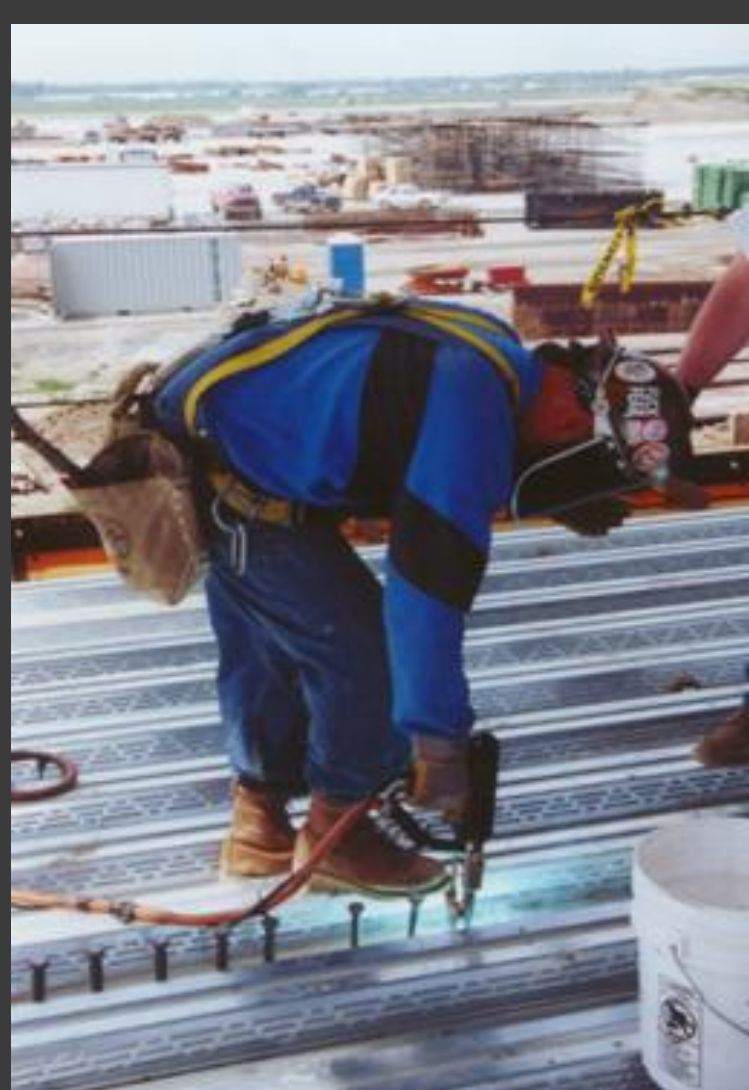
Effect of Prolonged Low Stress Lowers Thresholds for Subsequent Adaptation and Injury



The Law of Repetitive Motion

$$I = NF/AR$$

- ⦿ I = Insult or injury to tissues
- ⦿ N = Number of repetitions
- ⦿ F = Force or tension applied to tissues as % of maximum muscle strength
- ⦿ A = Amplitude (frequency) of stressor
- ⦿ R = Relaxation time between stressors



Understandable,
But Still Bad For You



Sweet Baby Jeebus
MAKE IT STOP!!!

Stages of Core Conditioning

- Recently injured
- Use Australian method of core conditioning, focusing on maintaining stable spine position
- Find posture that causes least pain and maintain
- Work on keeping core tight while performing movements at the hip and shoulder
- Focus on posterior chain strength before anterior chain strength

Stages of Core Conditioning

- Beginners
- Combination of Australian & McGill methods of core activation, individualize when necessary, → compound bracing
- Postural corrections as needed
- Get upright and moving as much as possible
- Work hip & T-spine mobility, lumbar stability
- Groove movement patterns with minimal weight, working on technical execution. Add weight when movements are precise

Stages of Core Conditioning

- Intermediate
- Can perform basic lifts like deadlift, front squat, 1-foot squat to parallel, with optimal joint mobility
- Work on anti-rotation, flexion & extension movts
- Focus on resisting spinal deformation!!!
- Work hamstrings & lats in 2:1 to quad & pec work
- Focus on technical precision with resisted overload
→ NOT MOVEMENT FAILURE!!!

Stages of Core Conditioning

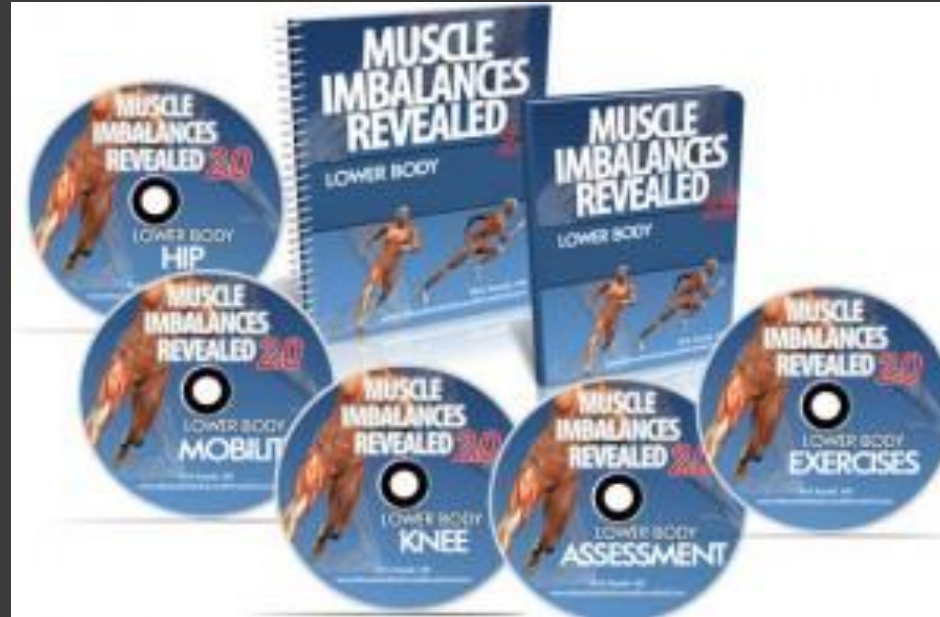
- Advanced
- Can perform basic lifts with max weight
- Allow some spinal movement with resisted overload
→ not terminal ROM
- Focus on speed development through hips, shoulders, and trunk power transference
- Technical components of lifts, working on max weight
- Core specific work, if needed, focuses on movements for goal activity

Show vs. Go??

- Ripped abs are made in the kitchen
- No exercise program will make you lean if your diet is crap.
- Genetics play a role, but so does training, eating right and getting enough sleep
- Fat cells have a memory, once fat, greater chance of staying or becoming fat again



THANK YOU!!!!!!!



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