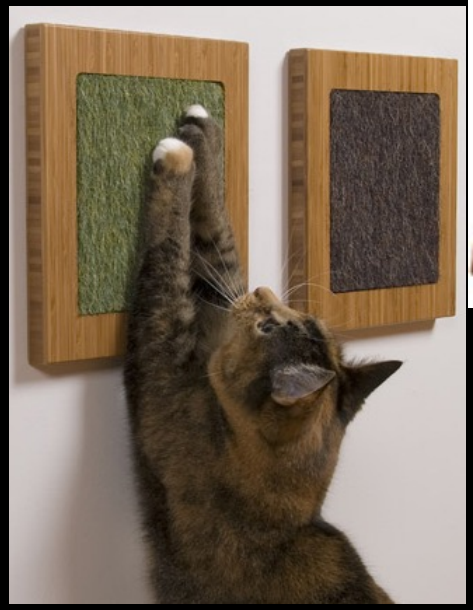
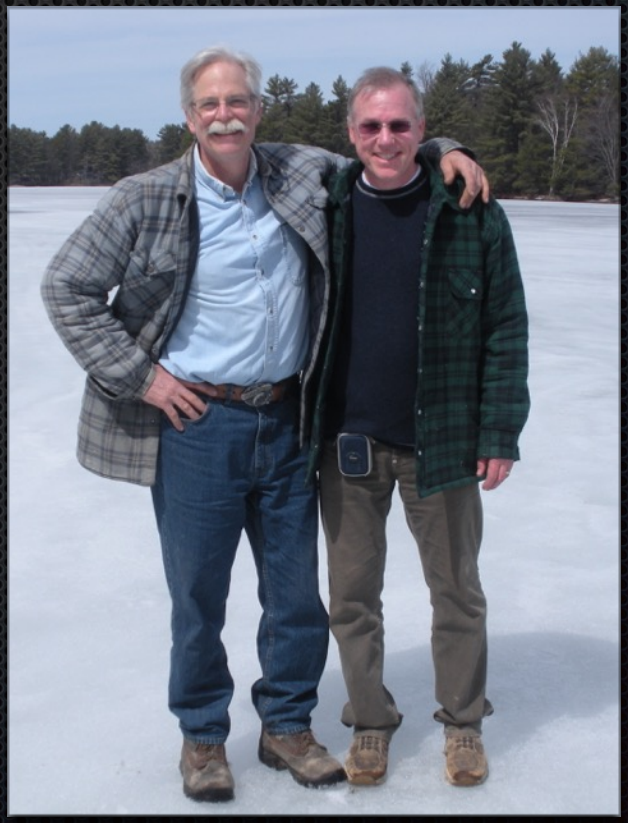
III) KEEPING THE BODY IN "TUNE"

- RECOVERY STRATEGIES
- ACTIVE RECOVERY
- MOBILIZATION
- SPARING THE SPINE



Stuart McGill, Ph.D.

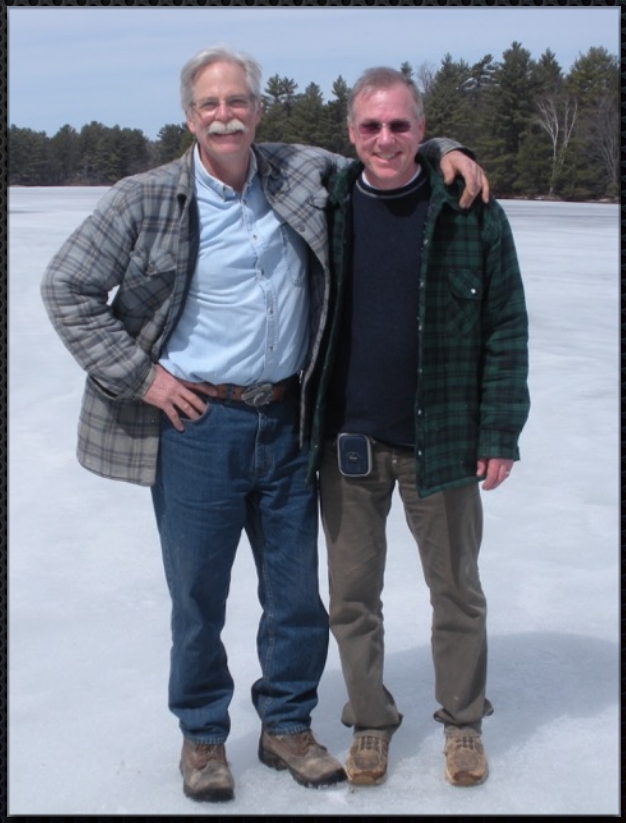
"The objective of injury prevention strategies is to ensure that tissue adaptation stimulated from exposure to load keeps pace with, and ideally exceeds the accumulated tissue damage."



DON’T BEAT YOURSELF UP - TRAINING FOR LIFE - TRAIN IN A SUSTAINABLE WAY - LEARN FROM YOUR INJURIES & PAST

Stuart McGill, Ph.D.

"By my early 50s I made a conscious decision to make it to retirement with as much remaining athleticism as possible."

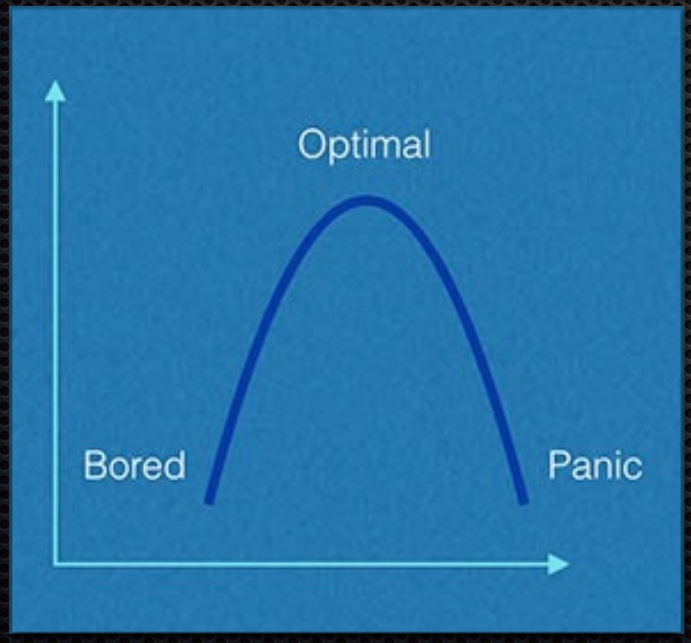


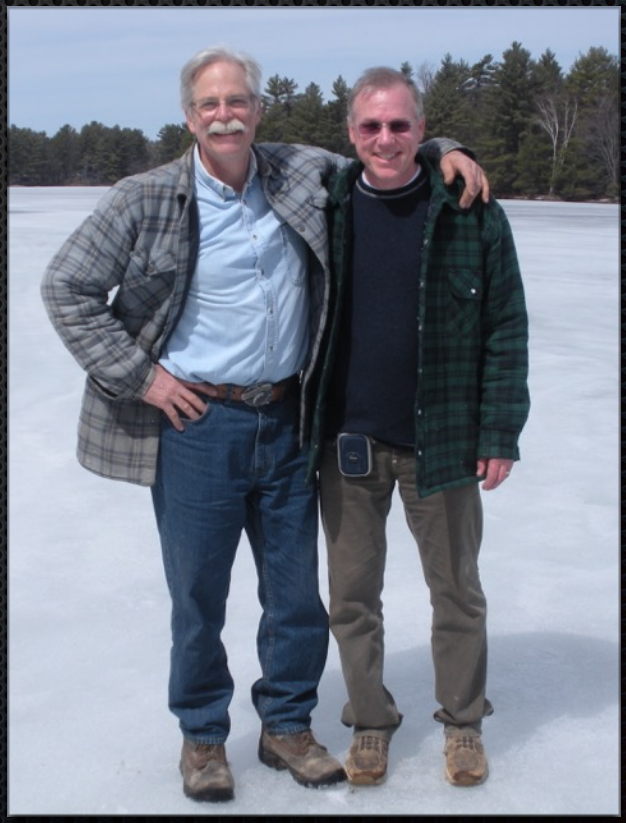
TRAIN SO WHEN YOU'RE DONE PLAYING YOU CAN DO WHATEVER YOU WANT TO DO
ACCEPT & FIND YOUR WEAKNESSES (KRYPTONITE) & WORK ON THEM

60 is the new 40

Stuart McGill, Ph.D.

"This is only achieved with moderation"





A) Recovery Strategies

"Recovery is the main limiting factor" - Mark Verstegen

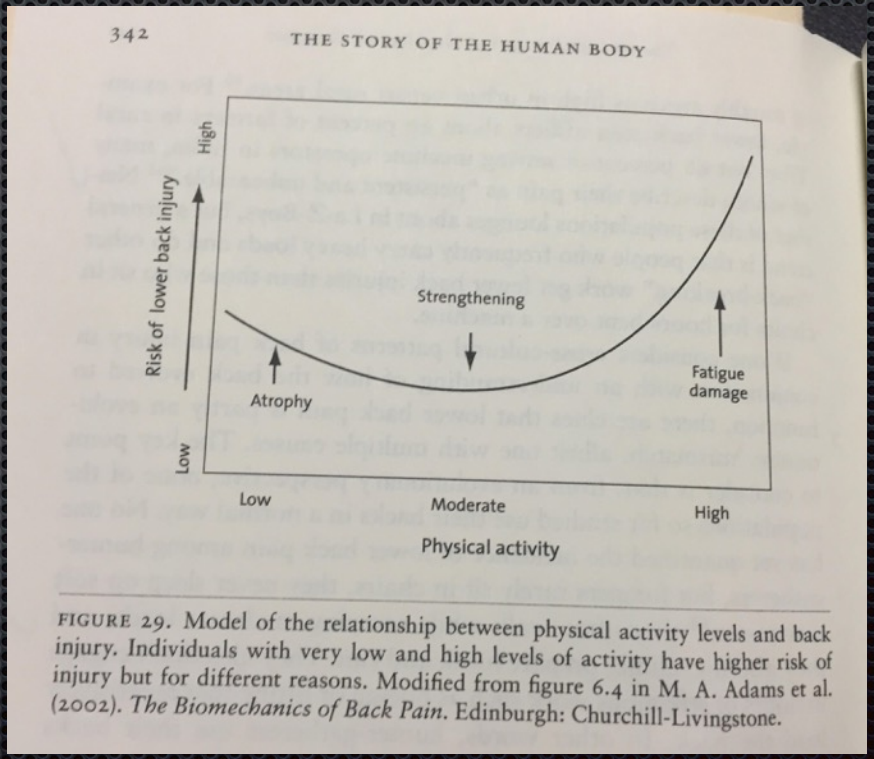


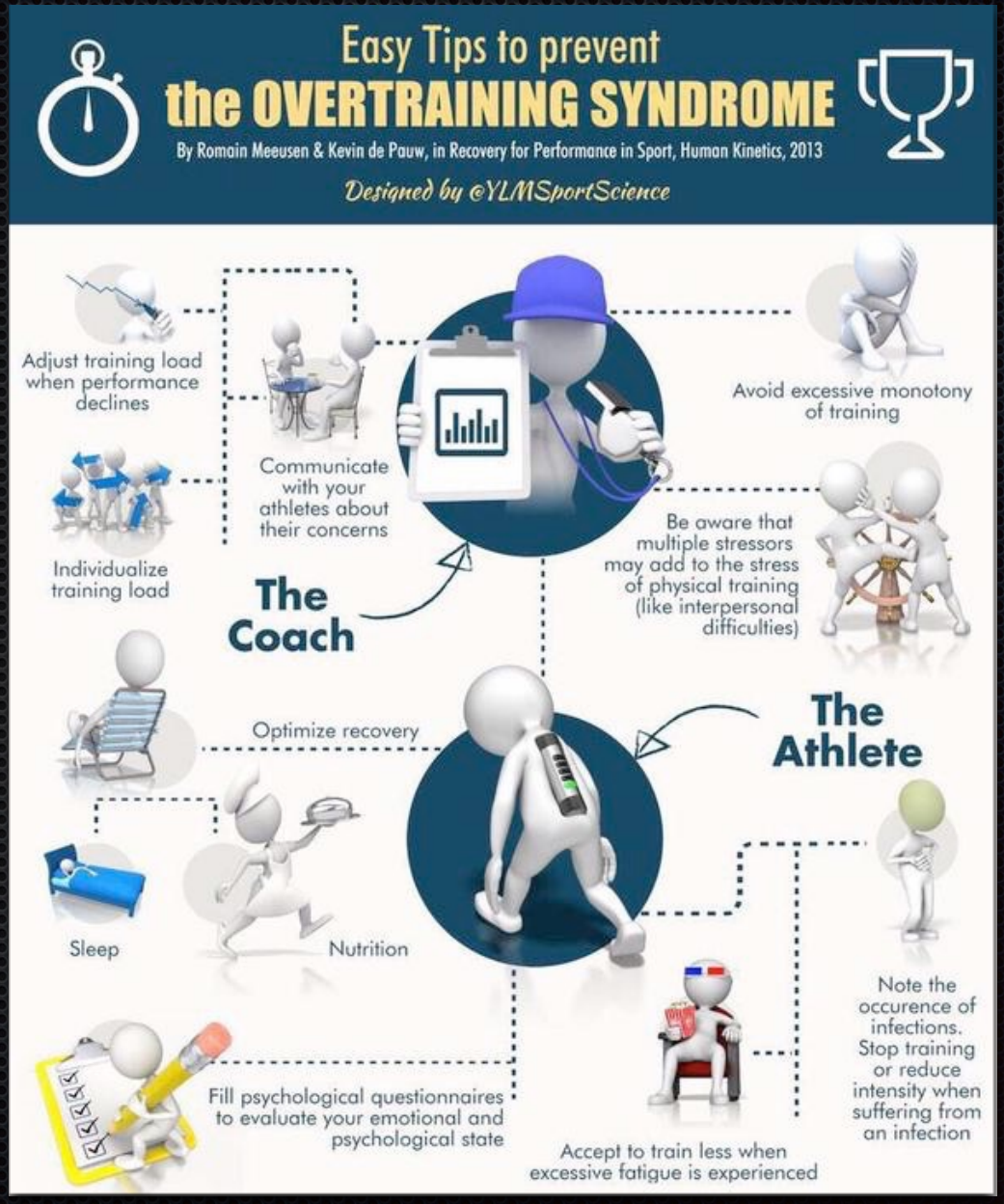
FIGURE 29. Model of the relationship between physical activity levels and back injury. Individuals with very low and high levels of activity have higher risk of injury but for different reasons. Modified from figure 6.4 in M. A. Adams et al. (2002). *The Biomechanics of Back Pain*. Edinburgh: Churchill-Livingstone.

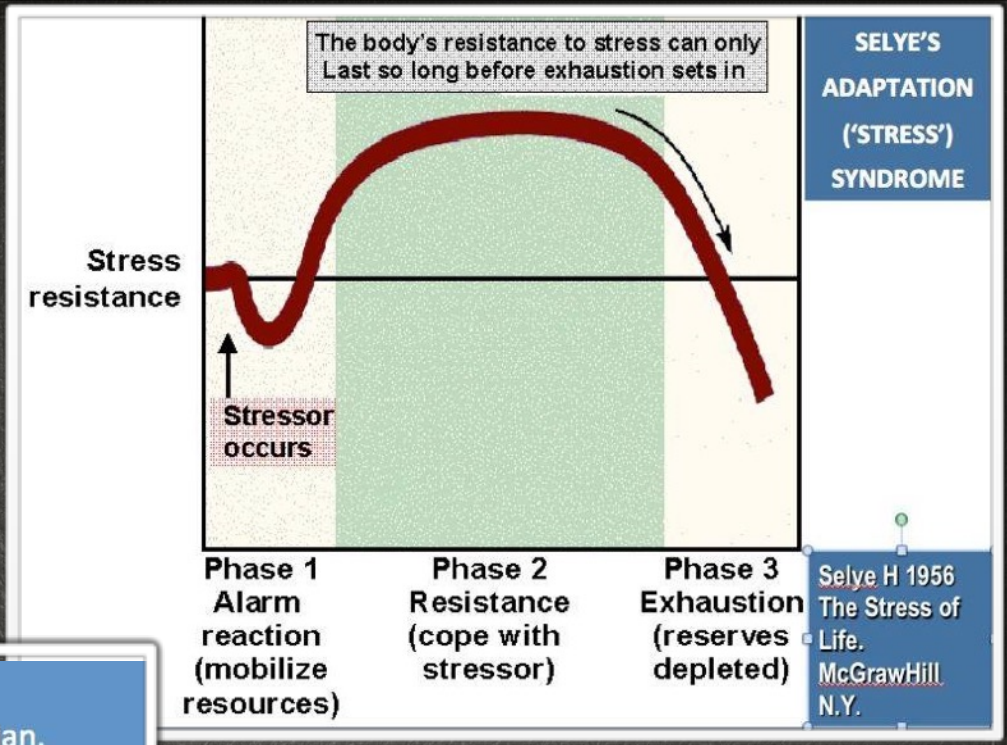
COACH

- Adjust training load when performance declines
- Individualize training
- Avoid monotony

ATHLETE

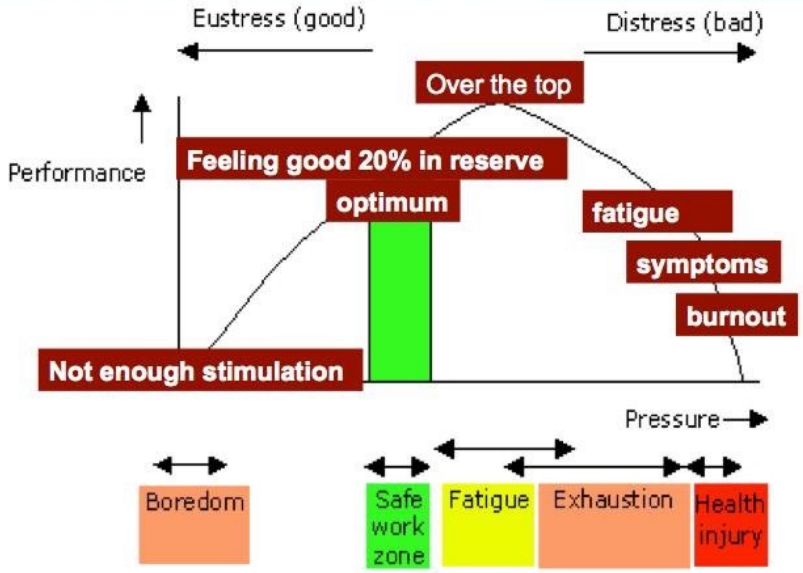
- Sleep/Nutrition
- Train less when fatigued





The Human Function Curve

Posen D 1995 (April) Stress Management for Patient & Physician. Canadian Jnl Continuing Education pp1-16



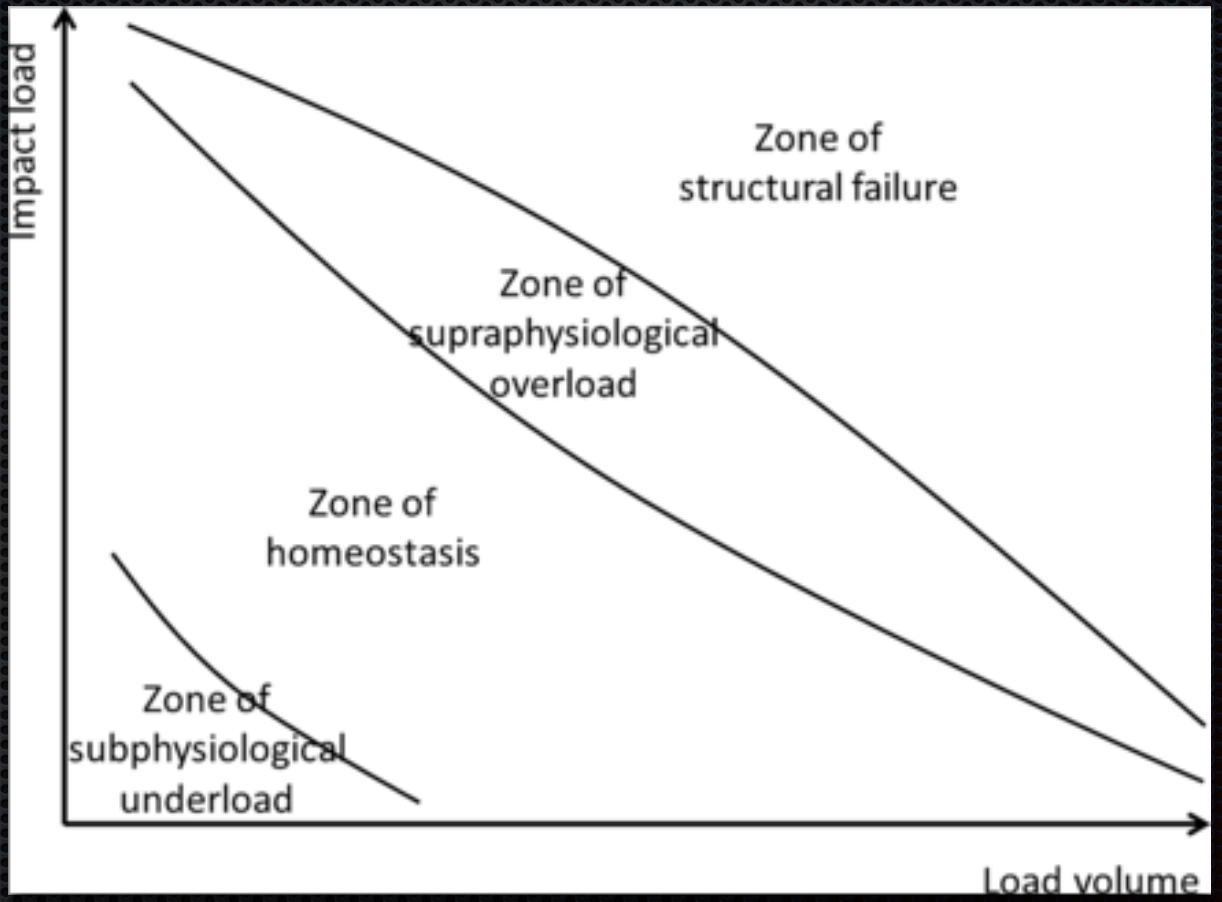
Damacles Sword:
The Paradox of the Talented

Charlie Francis

- 90% of my time is spent holding an athlete back to prevent overtraining, and only 10% is spent motivating them to do more work."

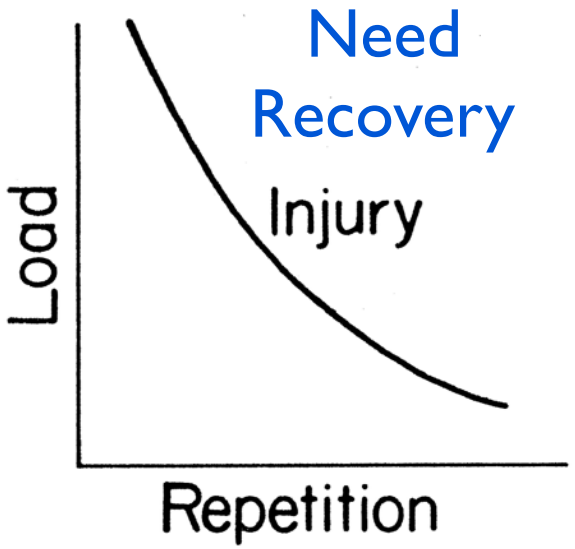
Relationship between structural adaptation and load (Dye 2005)

IMPACT LOAD: throwing speed, jump height or other measures of joint load



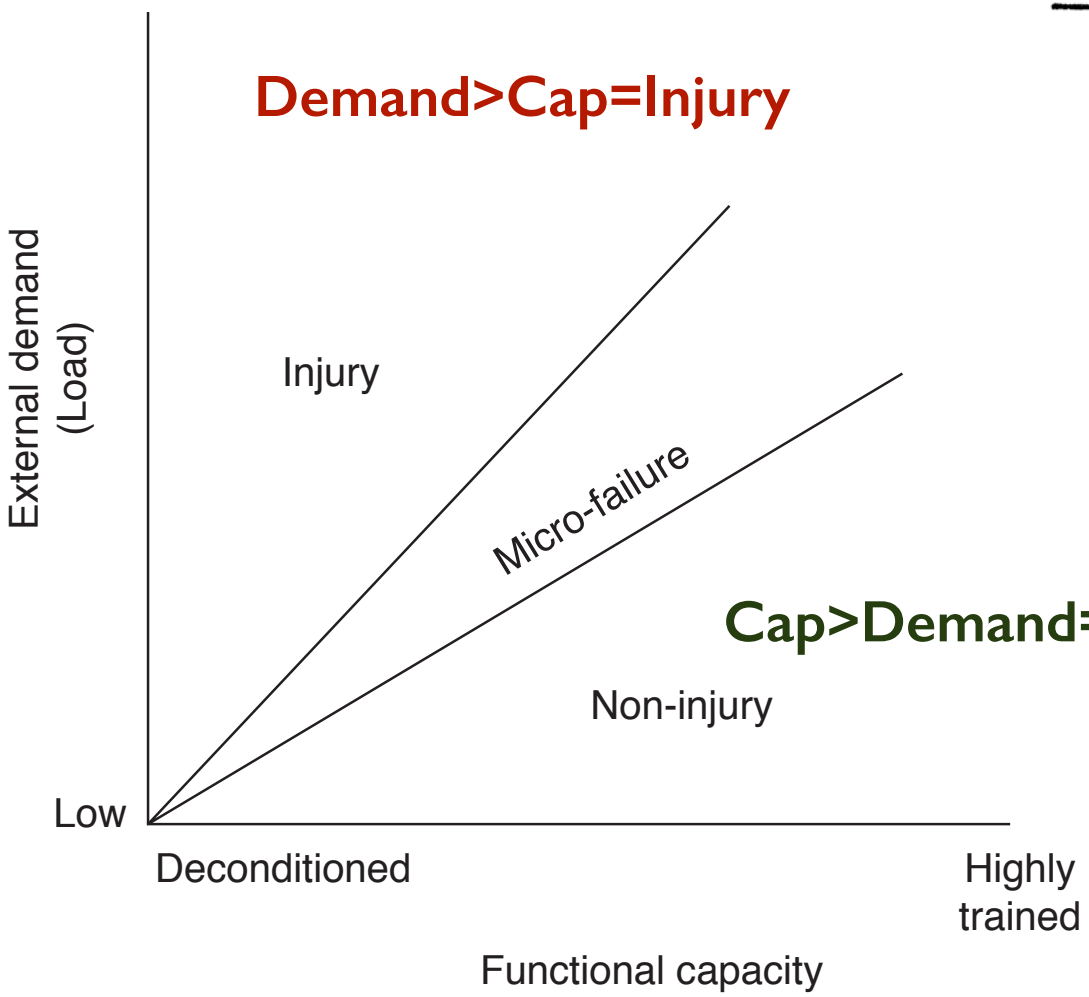
LOAD VOLUME: training volume (frequency, duration, intensity), match frequency, etc.

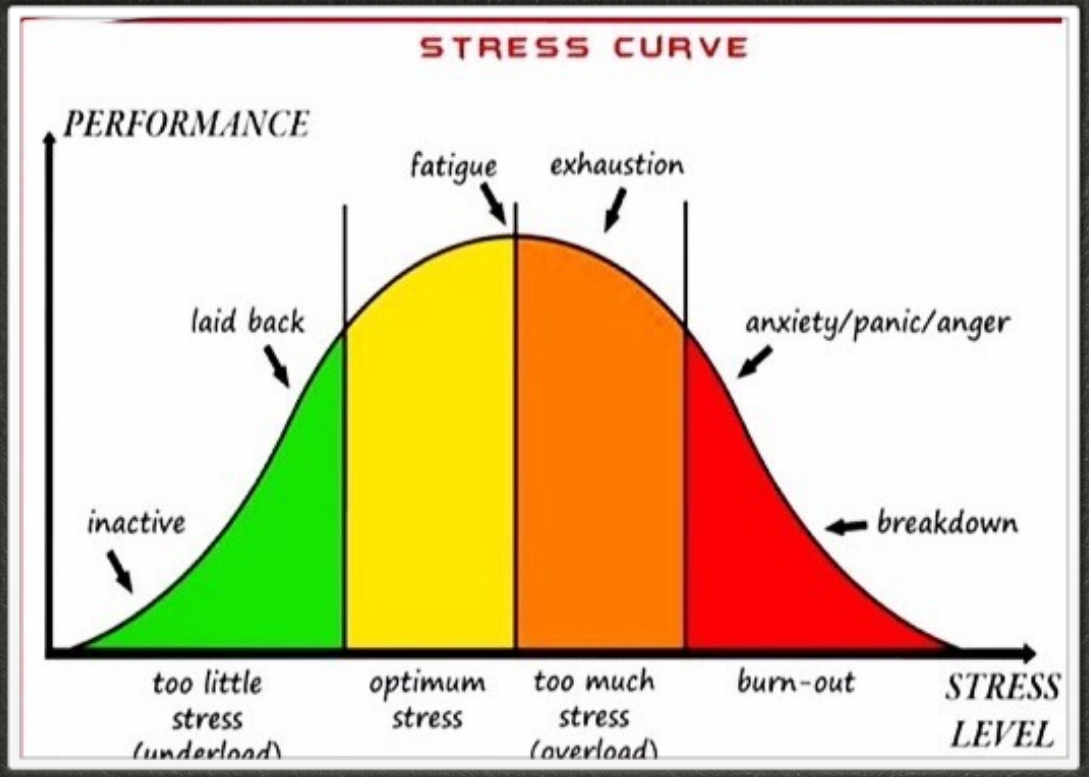
Tissue Tolerance



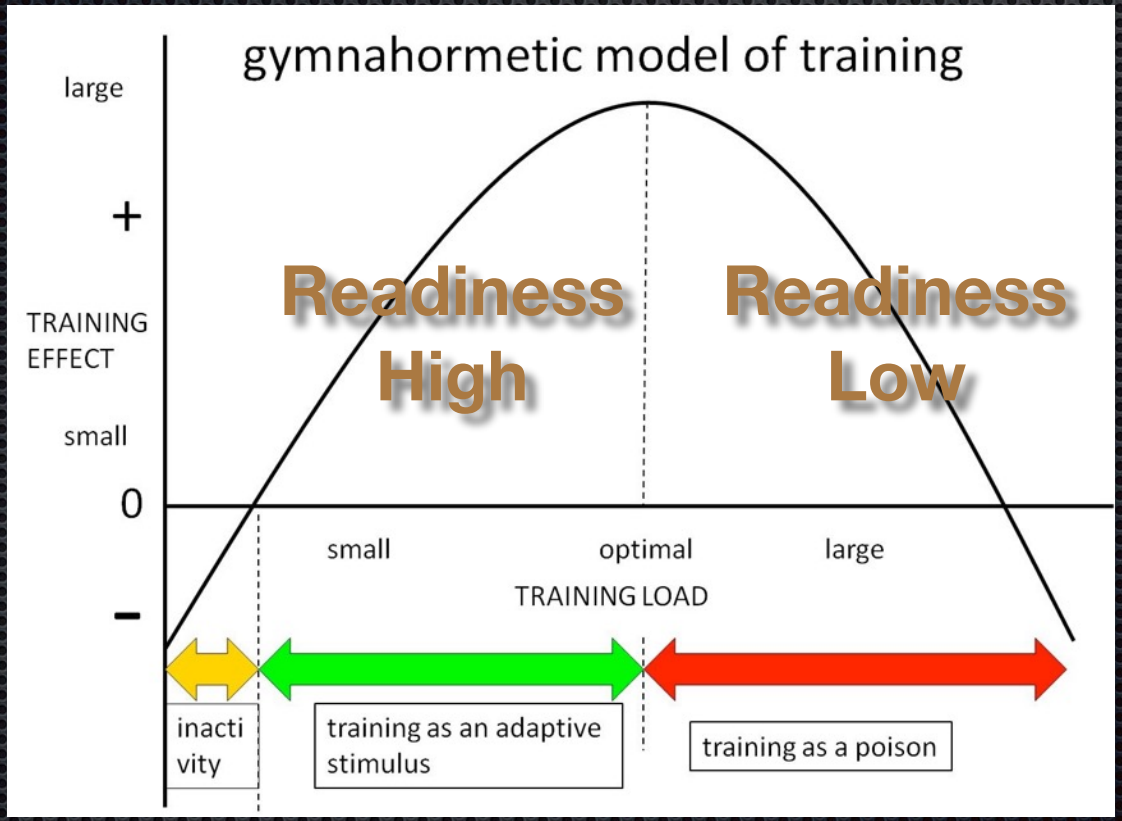
Demand>Cap=Injury

Cap>Demand= Durability




STRESS CURVE
PERFORMANCE
fatigue
exhaustion
laid back
anxiety/panic/anger
inactive
breakdown
too little stress (underload)
optimum stress
too much stress (overload)
burn-out
STRESS LEVEL

Training:
frequency, intensity & volume

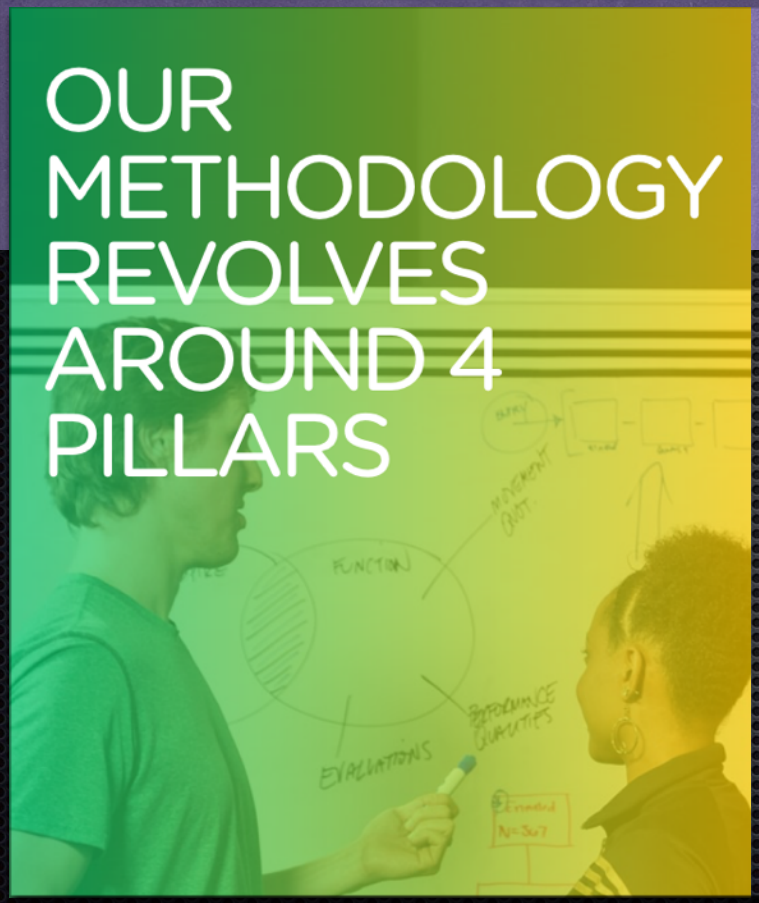


Henk Kraaijenhof

EQUINOX

EQUINOX

Philosophy



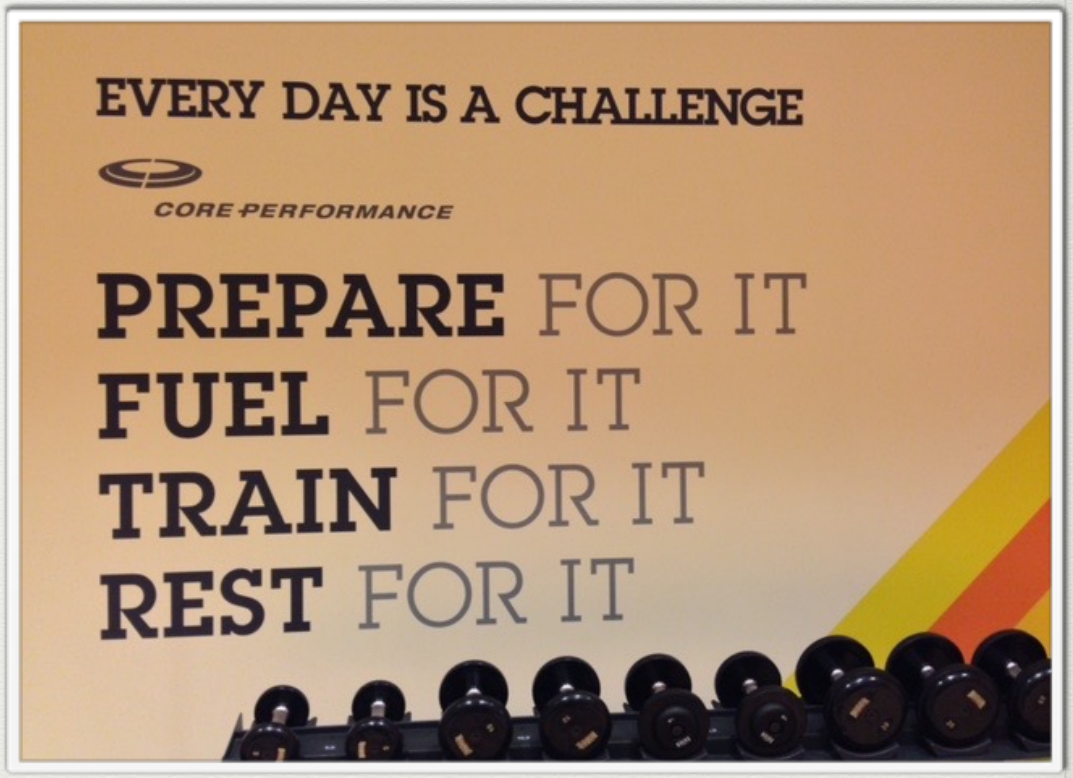
THE BROAD ELEMENTS OF A TRAINING PROGRAM CAN APPLY TO ANYONE. CONCENTRATE ON YOUR MINDSET, NUTRITION, MOVEMENT PATTERNS, AND RECOVERY.

MARK VERSTEGEN

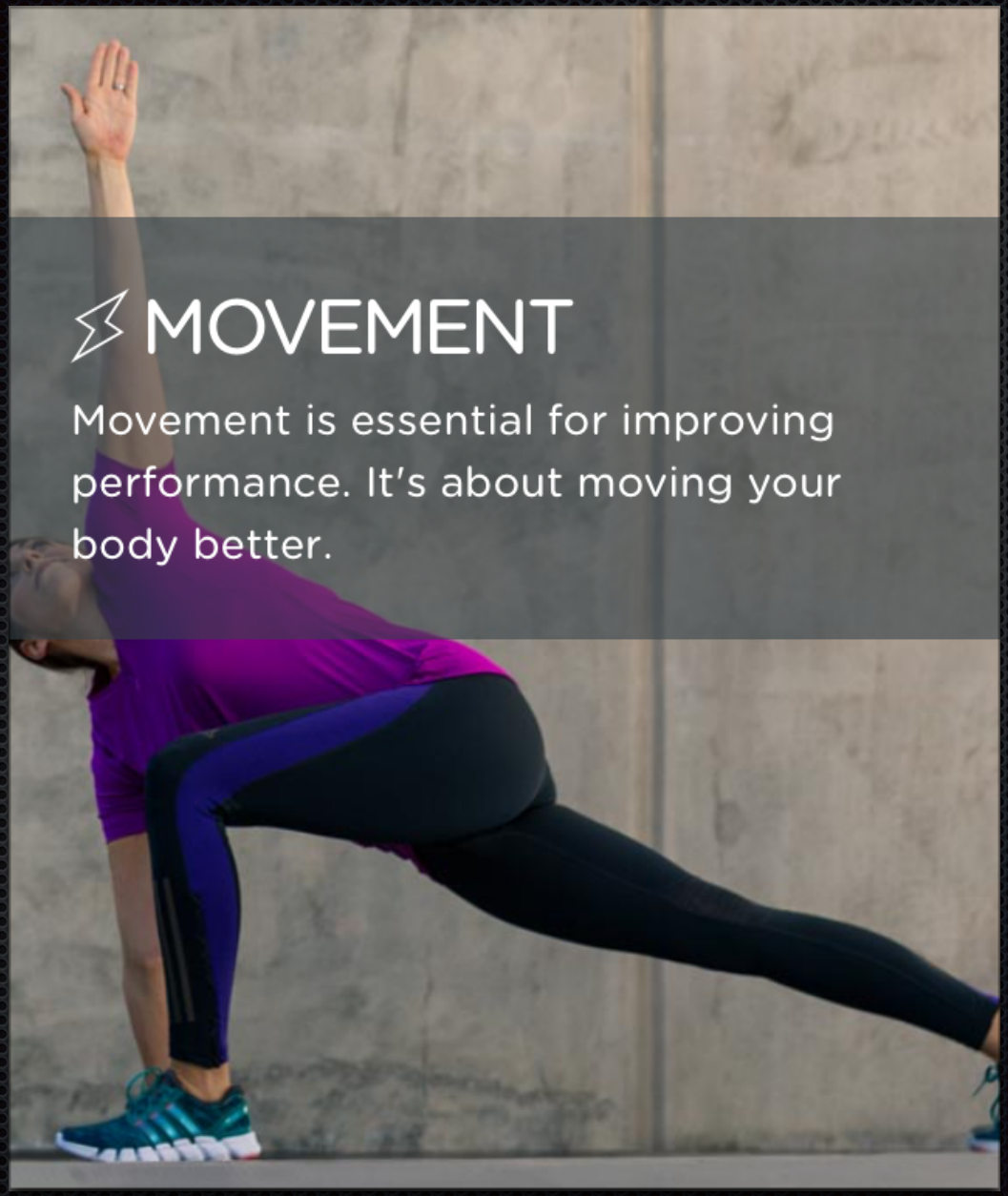

MINDSET
NUTRITION
MOVEMENT
RECOVERY

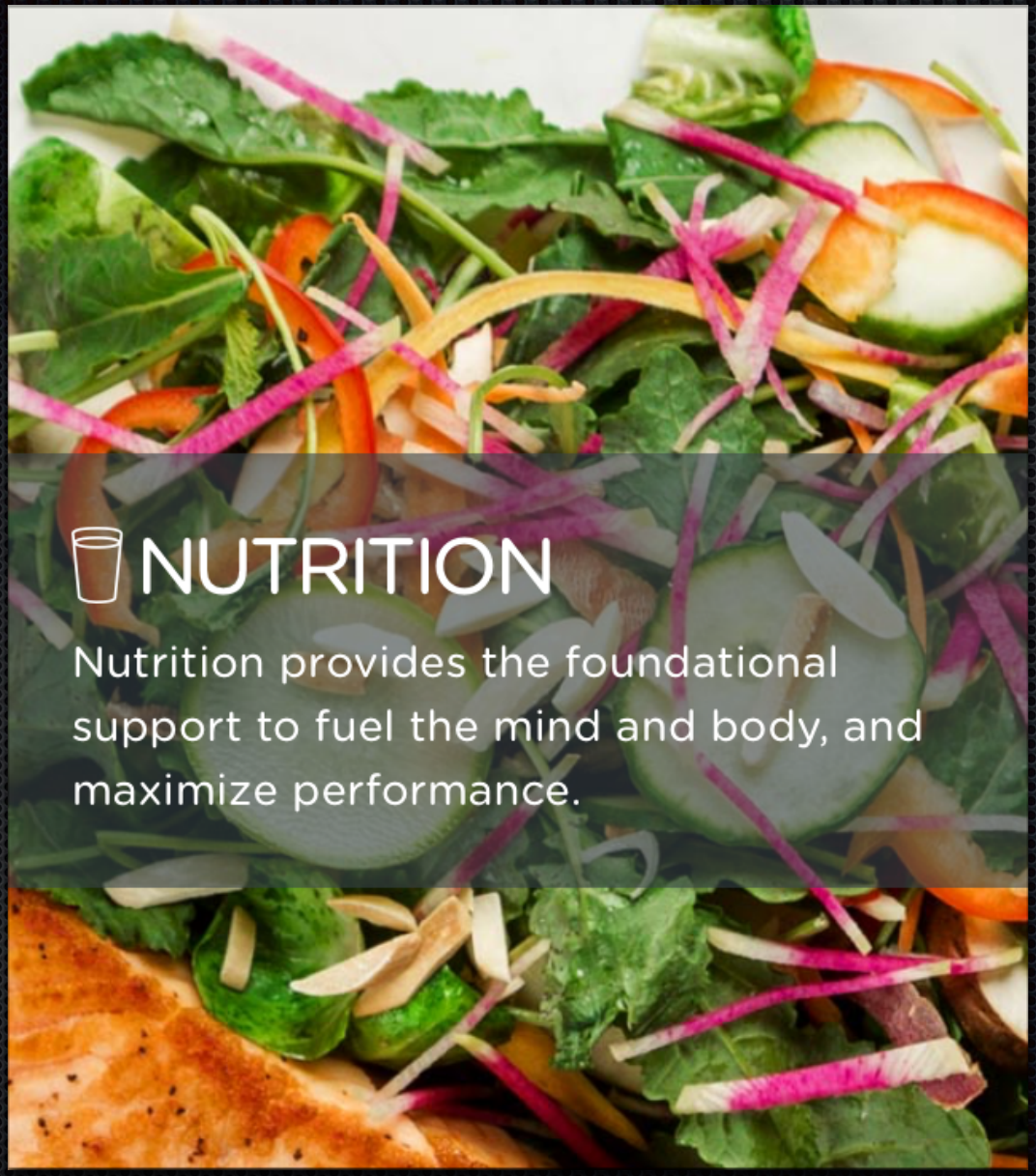
Philosophy - 4 Pillars

- Mindset
- Movement
- Nutrition/Fuel
- Recovery




MINDSET
Mindset is about dedicating oneself toward a goal with a full understanding of what it requires to accomplish it.


MOVEMENT
Movement is essential for improving performance. It's about moving your body better.


NUTRITION
Nutrition provides the foundational support to fuel the mind and body, and maximize performance.

INFLAMMATION

5 DIETARY CONTRIBUTORS TO INFLAMMATION

1 INFLAMMATORY FATS

Trans fat, excess omega-6 fatty acids, and fats from grain-fed animals can trigger inflammation and raise bad cholesterol.

2 ADDED SUGARS & ARTIFICIAL SWEETENERS

Found in processed food and beverages, added sugar can negatively impact blood vessels and gut health. The low-calorie artificial sweeteners can irritate the stomach lining and alter insulin and blood glucose levels.

3 REFINED GRAINS

Excess intake of enriched flours and starches is associated with higher levels of inflammatory markers.

4 PROCESSED MEATS

Sausage, deli meats, and bacon contain nitrates, sulfites, preservatives, and MSG, which are linked to inflammatory diseases such as cancer and heart disease.

5 ARTIFICIAL FLAVORS & COLORS

Present in some processed foods, beverages, seasonings, canned soups, and salad dressings, artificial flavors and colors contain excitotoxins, which can cause inflammation.

POWERED BY THORNE RESEARCH
EXOS
PERFORMANCE NUTRITION

10 FOODS HIGH IN OMEGA-3 FATTY ACIDS

1. Anchovies
2. Herring
3. Salmon
4. Sardines
5. Lake Trout
6. Tuna
7. Flaxseed
8. Chia seed
9. Walnuts
10. Fresh Basil

POWERED BY THORNE RESEARCH
EXOS
PERFORMANCE NUTRITION

Food For Thought

54% have changed their diet to combat the physical effects or appearance of aging
Eating foods that improve the blood biomarkers most associated with aging can help people optimize longevity

Fasting Glucose

EAT MORE

Avocado, Lentils, Spinach

Vitamin D

EAT MORE

Salmon, Cheese, Mushrooms

hsCRP (inflammation)

EAT MORE

Oranges, Grapefruit, Walnuts, Beets

ALT (Liver Function)

EAT MORE

Oatmeal, Artichokes, Blackberry

AIS Sports Supplement Framework

The ABCD Classification system

Designed by @YLMSportScience

A

Supported for use in specific situations in sport using evidence-based protocols

Sports drink, gels & bar
Whey protein
Iron & Calcium supplement
Multivitamin/mineral
Vitamin D
Probiotics (gut/immune)
Caffeine
B-alanine
Bicarbonate
Beetroot juice
Creatine

B

Deserving of further research and could be considered for provision to athletes under a research protocol or case-managed monitoring situation

Quercetin
Tart cherry juice
Exotic berries (acai, goji etc.)
Curcumin
Anti-oxidants C and E
Carnitine
HMB
Glutamine
Fish oils
Glucosamine

C

Have little meaningful proof of beneficial effects

Category A and B products used outside approved protocols

The rest – if you can't find an ingredient or product in Groups A, B or D, it probably deserves to be here!

D

Banned or at high risk of contamination with substances that could lead to a positive drug test

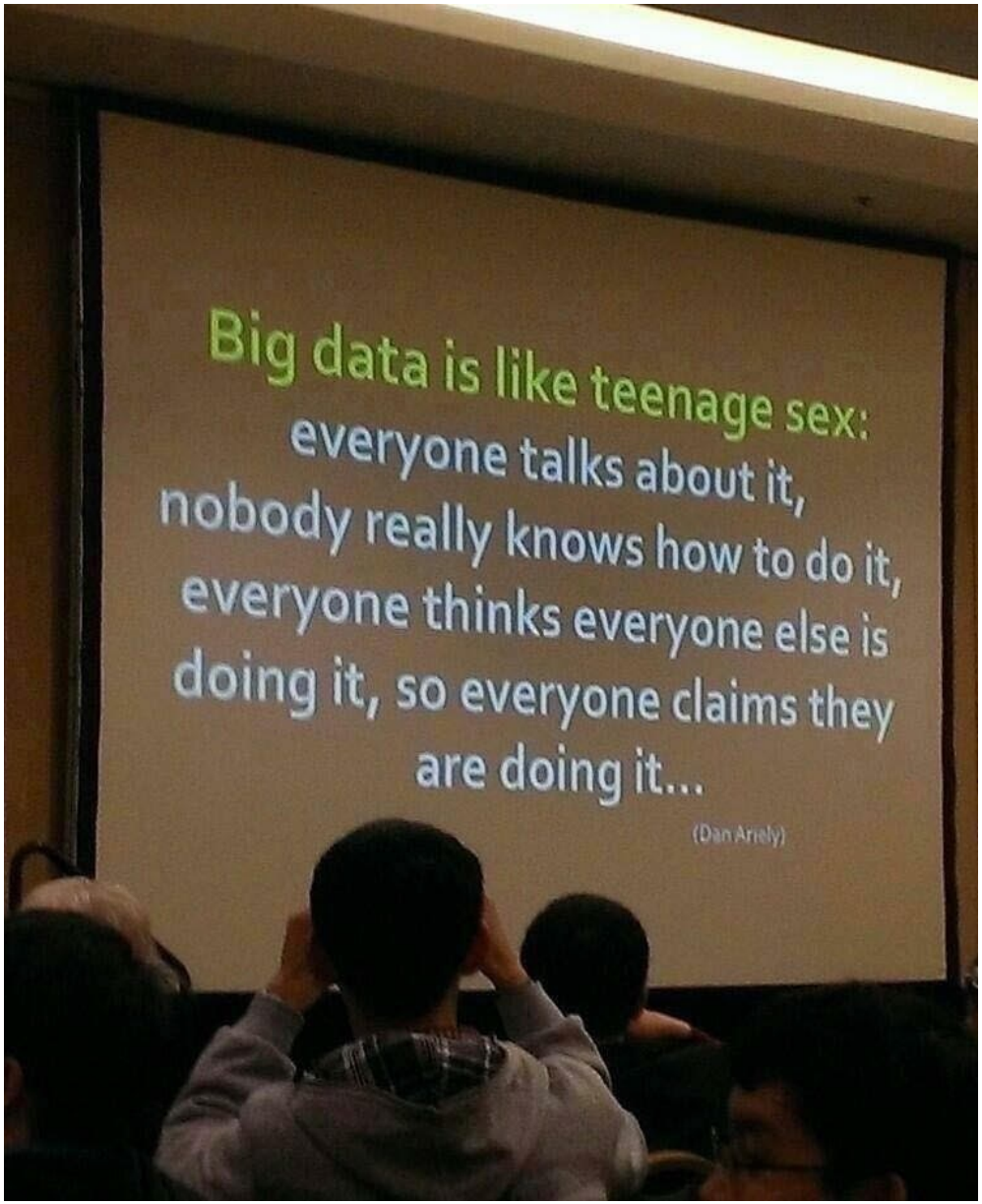
Ephedrine, Strychnine
Sibutramine
Methylhexanamine (DMAA)
Other herbal stimulants
DHEA, Androstenedione
19-norandrostenione/ol
Other prohormones
Tribulus terrestris and other testosterone boosters
Maca root powder
Glycerol, Colostrum


RECOVERY
Recovery allows the mind and body to re-energize and prepare for the next day's activity.

"Athletes who sleep on avg <8h/night have 1.7X risk of injury" Yann Le Meur

EXOS

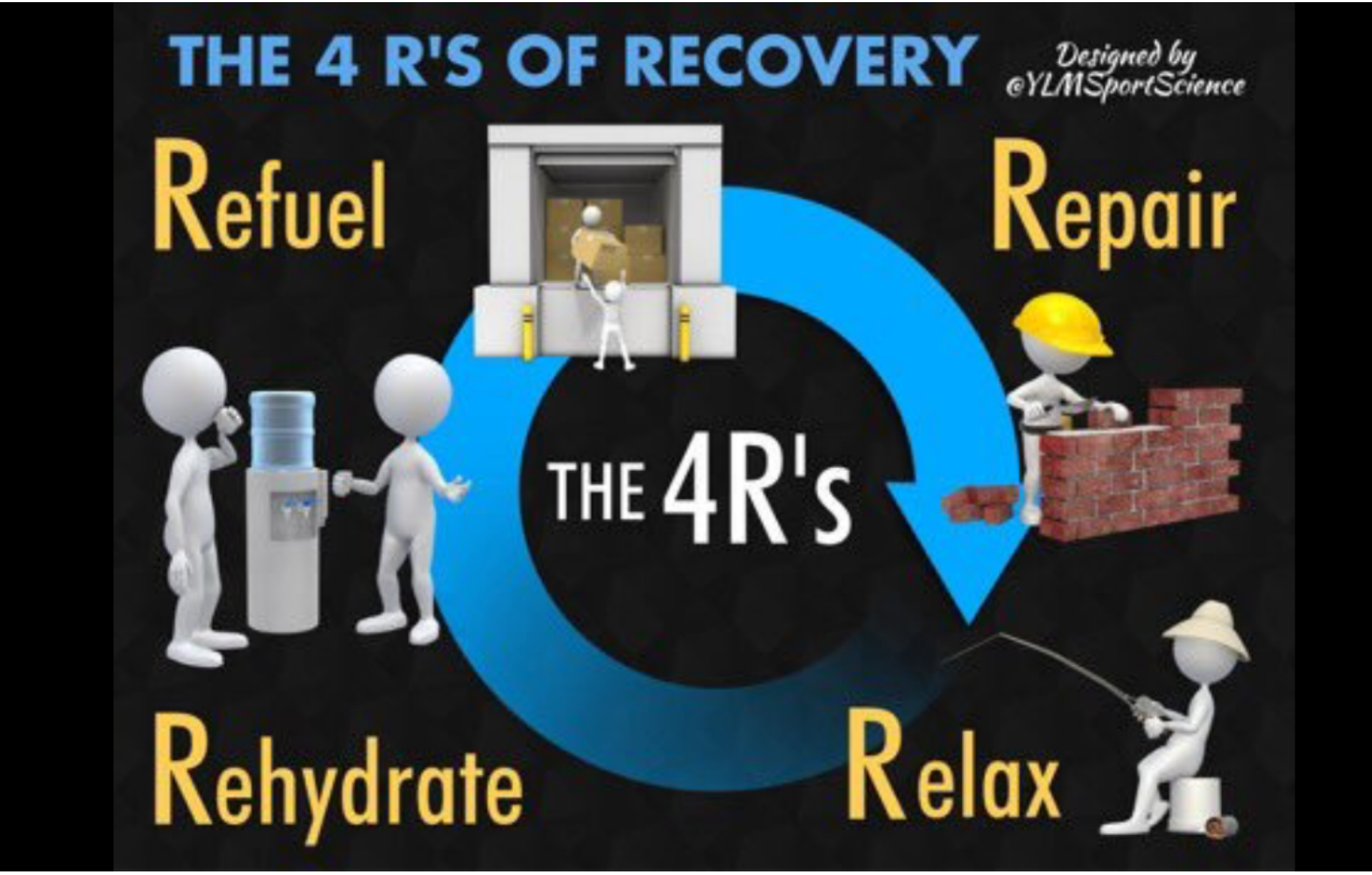

The Injury Prevention Pyramid
The Sports Physio @adammeakins
Other
Bull Shit
Quackary
Tapes/braces
Stretching
Movement Skill
Strength Training
Load Management


Big data is like teenage sex:
everyone talks about it,
nobody really knows how to do it,
everyone thinks everyone else is
doing it, so everyone claims they
are doing it...
(Dan Ariely)


SYSTEMATIC APPROACH TO MONITORING ELITE TEAM SPORT ATHLETES
IMMUNE
HORMONAL
BIOCHEMICAL
PERFORMANCE (NON-EXHAUSTIVE), PHYSIOLGICAL & FUNCTIONAL
SUBJECTIVE SELF REPORT MEASURES

THE 4 R'S OF RECOVERY

Designed by ©YLMSportScience



Training Overload, Sleep & Health

Designed by @YLMSportScience

Methods

27 triathletes assigned to either overload or normal training groups

Performance

Mood states

Sleep (actimetry)

Health

Results

Of the 18 overload training group subjects, 9 were diagnosed as functionally overreached and demonstrated

Higher prevalence of upper respiratory tract infections

Decreased sleep quality

Practical implications

When they are exposed to high training load, endurance athletes should be encouraged

To ensure ideal sleeping environment (quiet, cool, and dark)

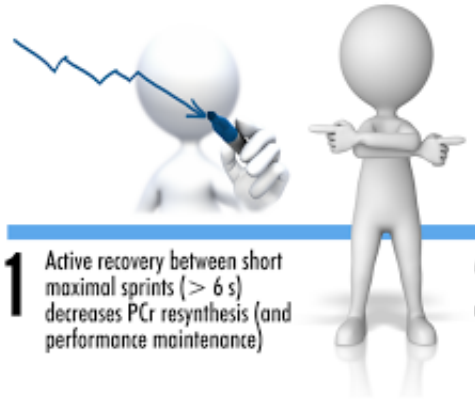
To avoid early morning schedule

To nap for short periods during the day

Reference
Hausswirth et al. Med Sci Sport Exerc 2014

ACTIVE RECOVERY

By Yann Le Meur & Christophe Hausswirth
in Recovery for Performance in Sport, Human Kinetics, 2013



1 Active recovery between short maximal sprints (> 6 s) decreases PCr resynthesis (and performance maintenance)

2 Active recovery between long sprints (>20s) accelerates the return to homeostasis and reduces the oxygen debt accumulated at the start of exercise

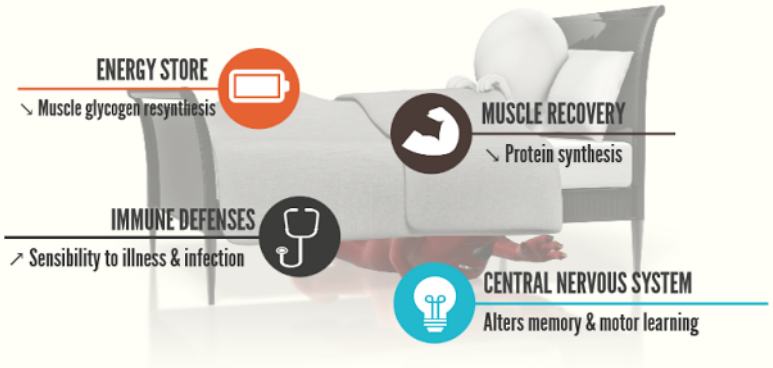
4 During short interval training, passive and active modalities lead to similar accumulated time near VO2max

3 During interval training aiming to develop VO2max using long intervals (> 30 s), active recovery increases aerobic contribution through faster VO2 kinetics and higher VO2 level during recovery

5 When performances must be repeated in a short period (< 30 min), active recovery should be planned because it accelerates the return to homeostasis. No clear benefit appears from maintaining submaximal exercise intensity when maximal exercises are interspersed by longer recovery periods. In this case, other strategies, including nutrition, rest, massage, or cold-water immersion are preferred for promoting recovery.

2 MIN GUIDE: SIMPLE TIPS TO IMPROVE YOUR SLEEP

Effects of sleep deprivation



Checklist to sleep better

KEEP A REGULAR SLEEP SCHEDULE

- Getting back in sync with your body's natural sleep–wake cycle is one of the most important strategies for achieving good sleep
- Set a regular bedtime & wake up at the same time every day
- When possible, do your intense training sessions early in the day rather than in the evening to reduce sleep onset latency

CREATE A RELAXING BEDTIME ROUTINE

- Turn off your television. No tablet & cellular phone
- Take a hot shower or leisurely warm bath before bedtime
- Reserve your bed for sleeping

EAT AND DRINK CORRECTLY

- Stay away from big meals at night
- Cut down on caffeine
- Avoid drinking too many liquids in the evening
- Avoid drinking alcohol

MAKE YOUR BEDROOM MORE SLEEP FRIENDLY

- Keep noise down
- Keep your room dark and cool
- Make sure your bed is comfortable

GET ANXIETY & STRESS IN CHECK

- Adopt a deep breathing
- Tense all the muscles as tightly as you can, then relax
- Close your eyes and try taking deep, slow breaths

AN INFOGRAPHIC BY

@YLMSportScience

B) ACTIVE RECOVERY

Instinctive sleeping and resting postures: an anthropological and zoological approach to treatment of low back and joint pain

Michael Tetley

BMJ VOLUME 321 23–30 DECEMBER 2000 bmj.com

Summary points

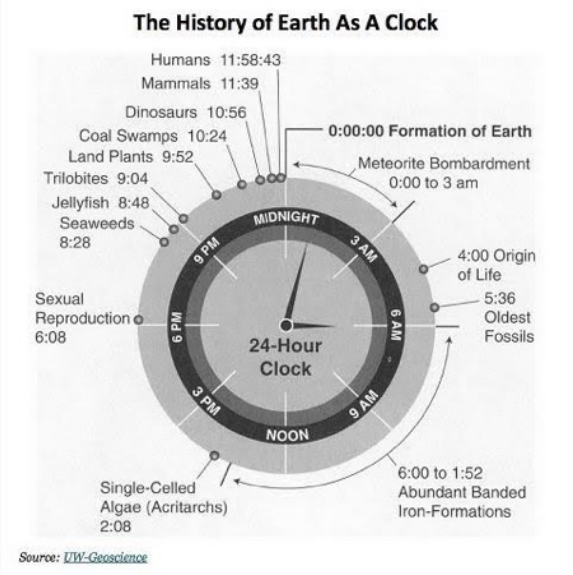
Forest dwellers and nomads suffer fewer musculoskeletal lesions than "civilised" people

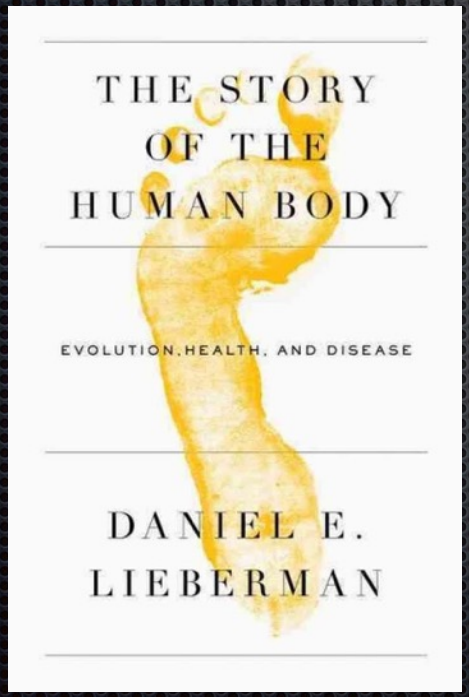
Nature's automatic manipulator during sleep is the kickback against the vertebrae by the ribs when the chest is prevented from movement by the forest floor

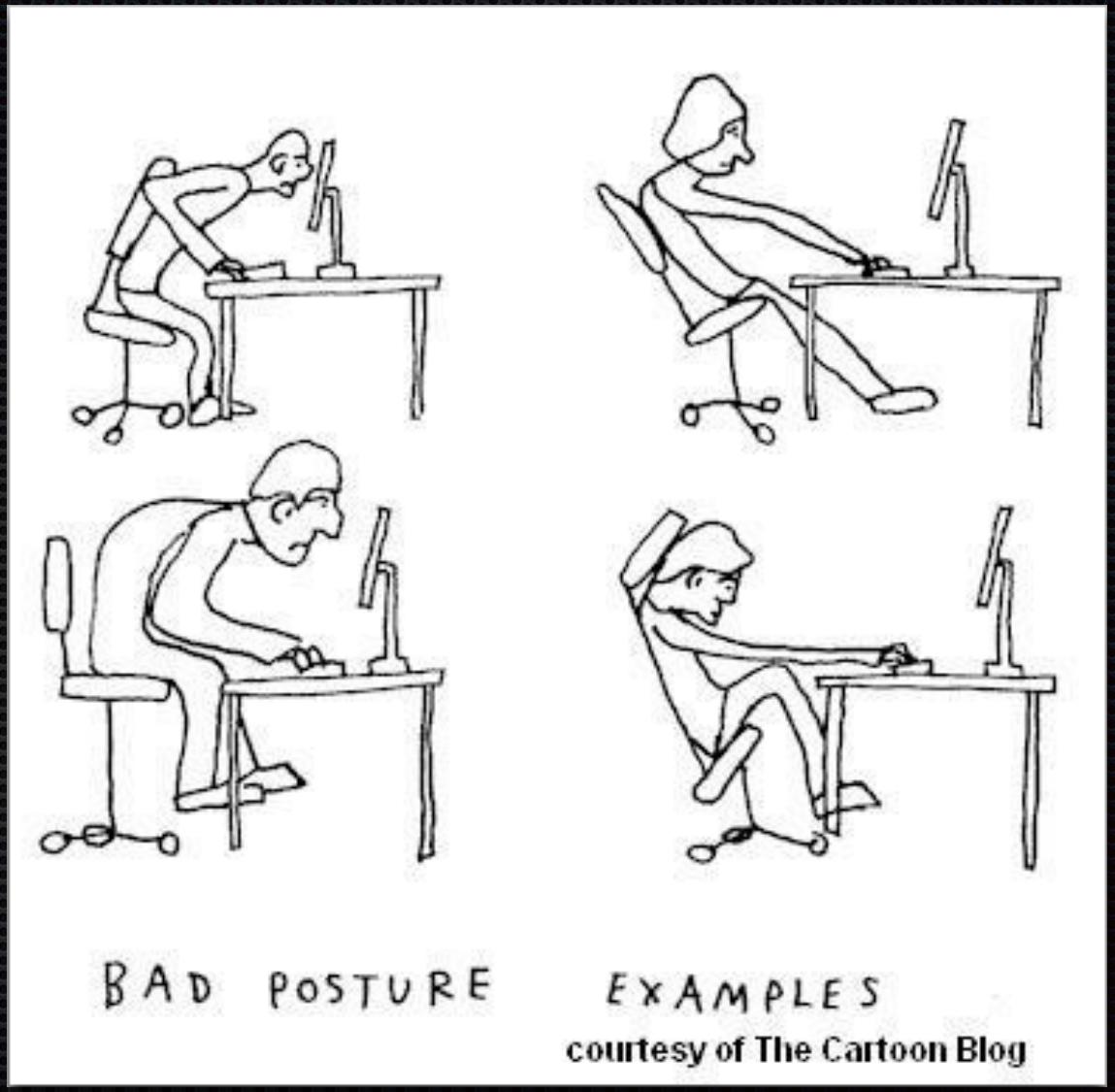
Various resting postures correct different joints

Pillows are not necessary

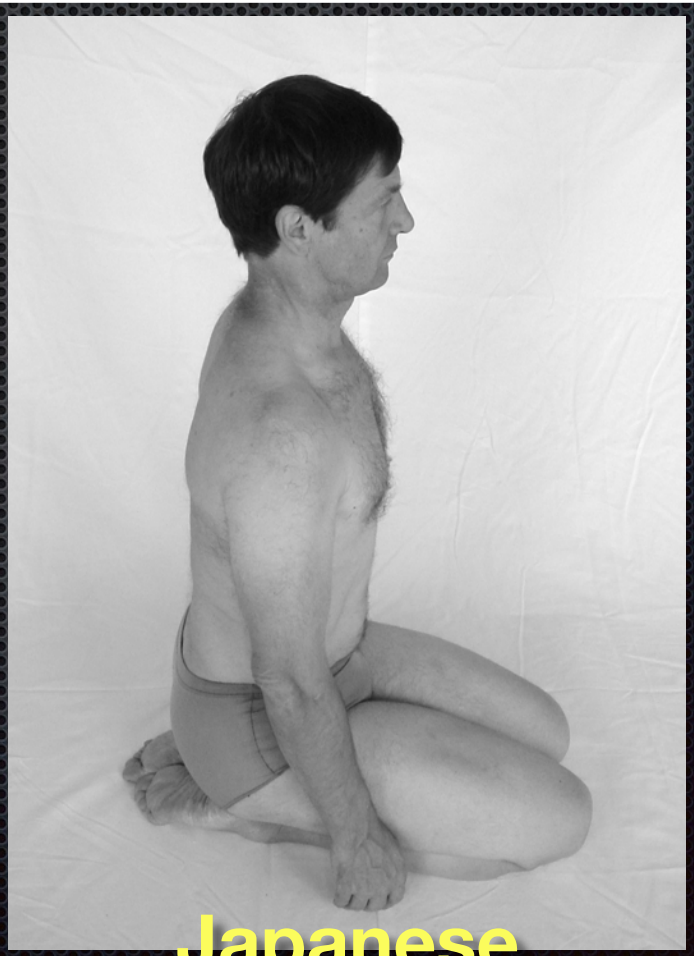
Fig 5 Quadrupedal lying


The History of Earth As A Clock
Humans 11:58:43
Mammals 11:39
Dinosaurs 10:56
Coal Swamps 10:24
Land Plants 9:52
Trilobites 9:04
Jellyfish 8:48
Seaweeds 8:28
0:00:00 Formation of Earth
Meteorite Bombardment 0:00 to 3 am
4:00 Origin of Life
5:36 Oldest Fossils
Sexual Reproduction 6:08
6:00 to 1:52 Abundant Banded Iron-Formations
Single-Celled Algae (Acritarchs) 2:08
MIDNIGHT
3 AM
6 AM
9 AM
NOON
3 PM
6 PM
9 PM
24-Hour Clock
Source: UW-Geoscience


THE STORY OF THE HUMAN BODY
EVOLUTION, HEALTH, AND DISEASE
DANIEL E. LIEBERMAN


BAD POSTURE EXAMPLES
courtesy of The Cartoon Blog

Primal Rest Poses



Japanese

Toes Under Bent Forward

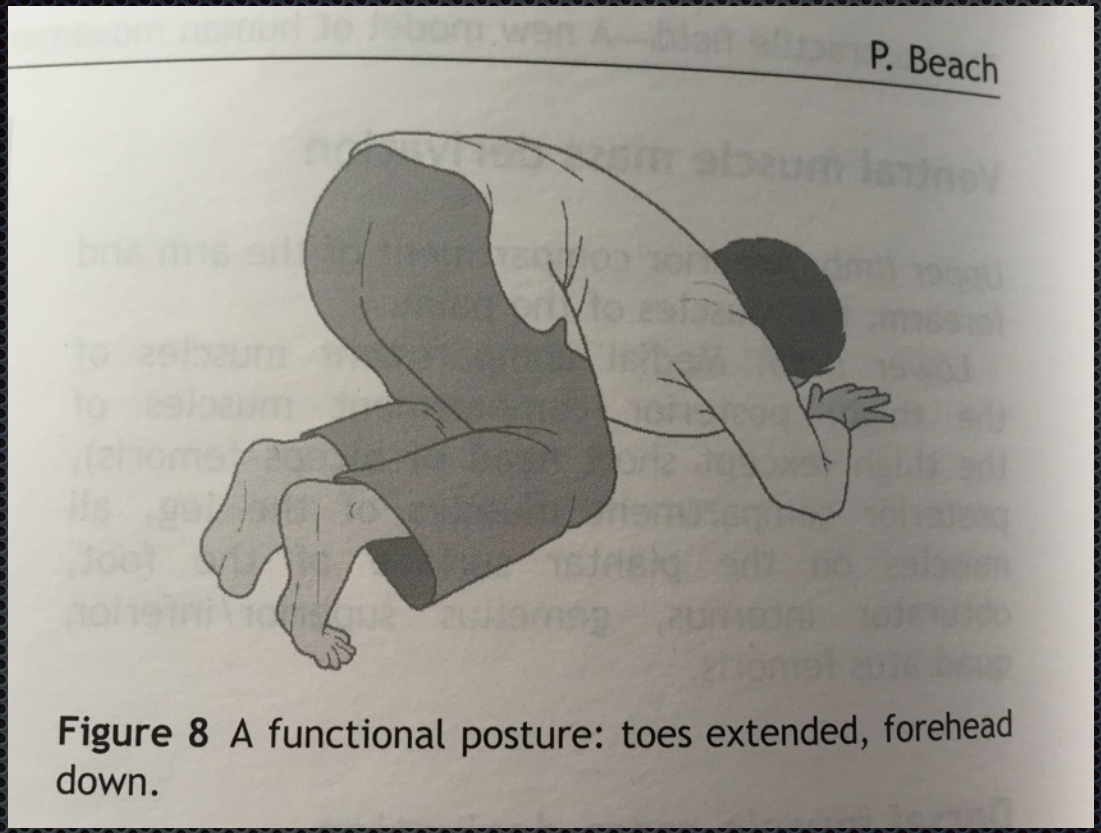
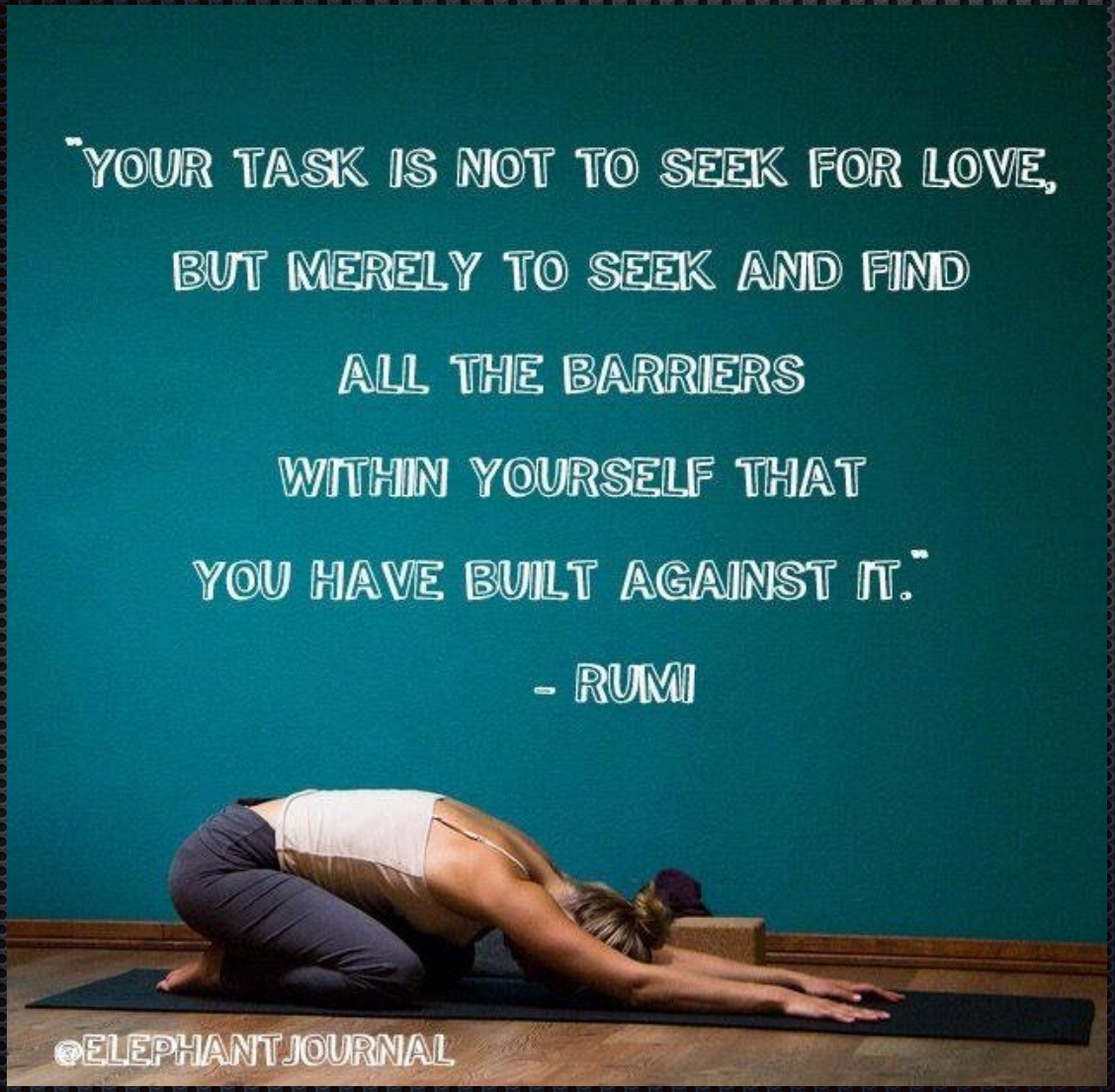


Figure 8 A functional posture: toes extended, forehead down.

Drinking Pose/Prayer

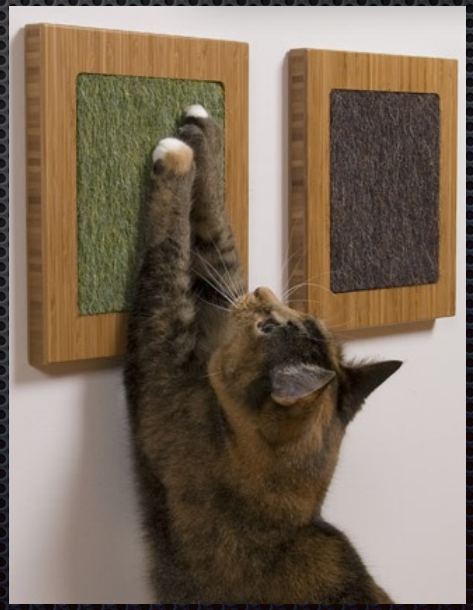


Full Squat

Full Squat

Fig 7 The full squat

C) MOBILIZATIONS



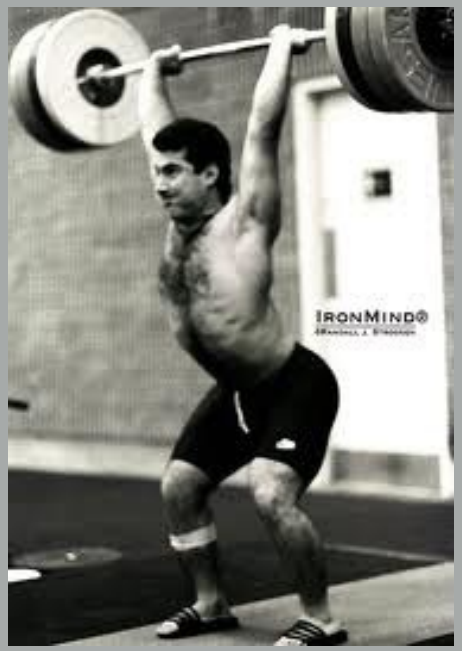
LOAD SHARING

TEST

- SQUAT
- LUNGE

Every Exercise is a Test

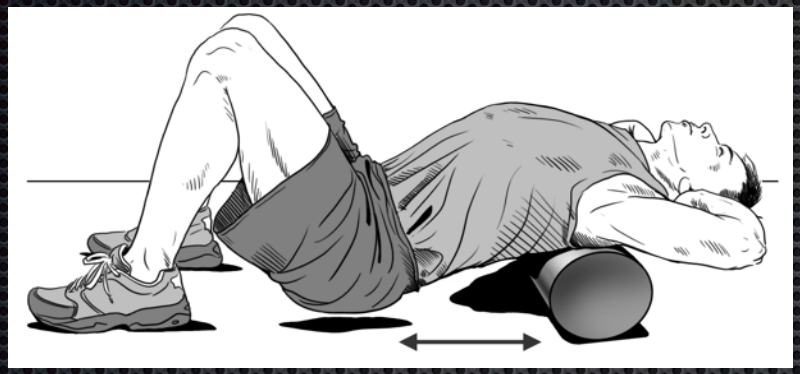
Is there a primarily mobility or stability issue?



- If poor mobility is suspected by positive passive or non-weight bearing tests then releasing tight structures first is a good “rule of thumb”. Examples –
- *restricted ankle mobility during a squat*
- *tight hip flexors or rectus femurs during bridges*
- *stiff upper thoracic kyphosis during arm elevation*

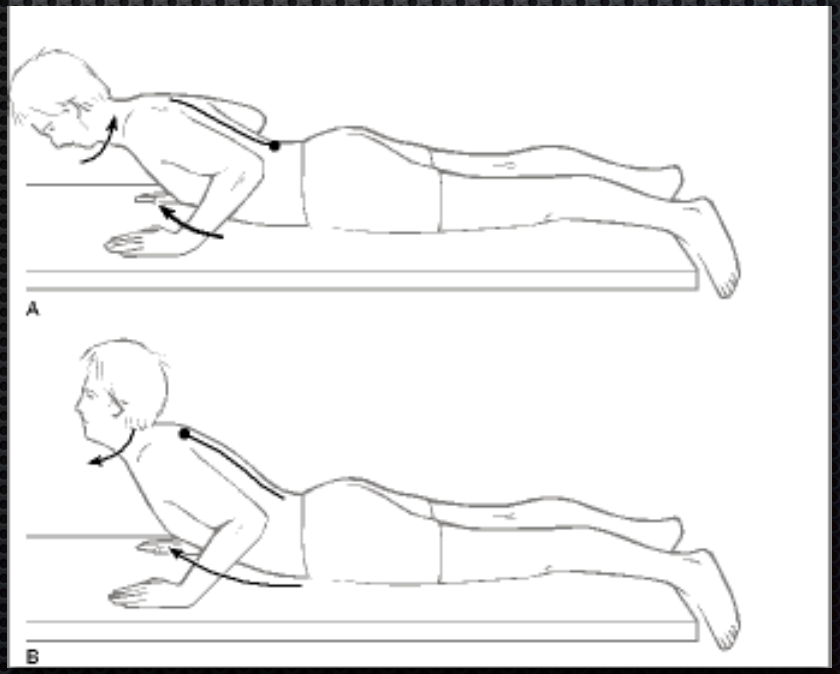
- Synergists can also substitute causing faulty movement patterns. Examples –
- *overactive shoulder shruggers during arm elevation (UCS)*
- *overactive paraspinals during leg extension (LCS/ open scissors)*
- *overactive SCMs when holding the head up (Head Forward Posture)*

1. Thoracic Mobilizations

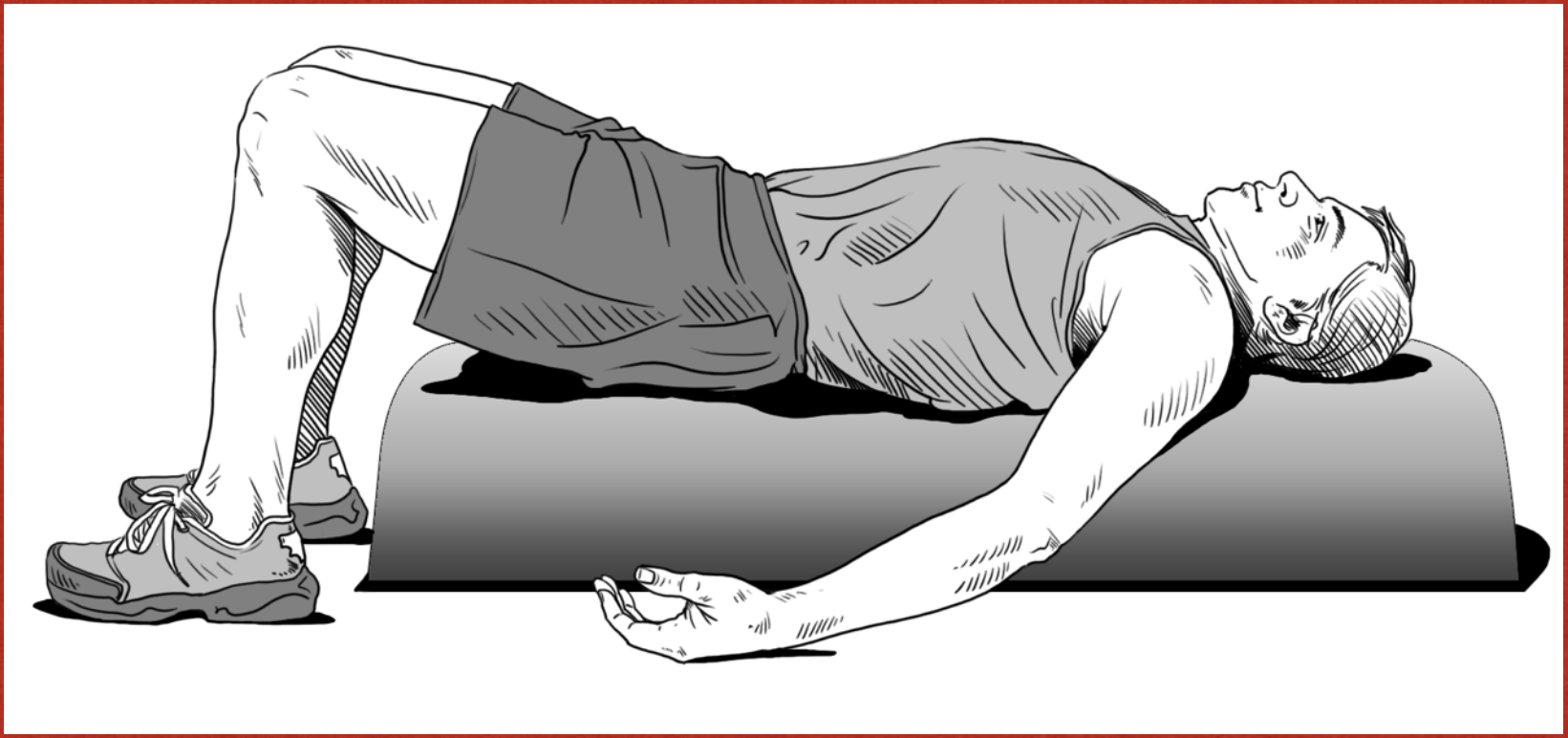


Jiri Cumpelik's Prone T4 Mobilization

A - correct
B - incorrect due to LCS & C0-C1 hyperextension

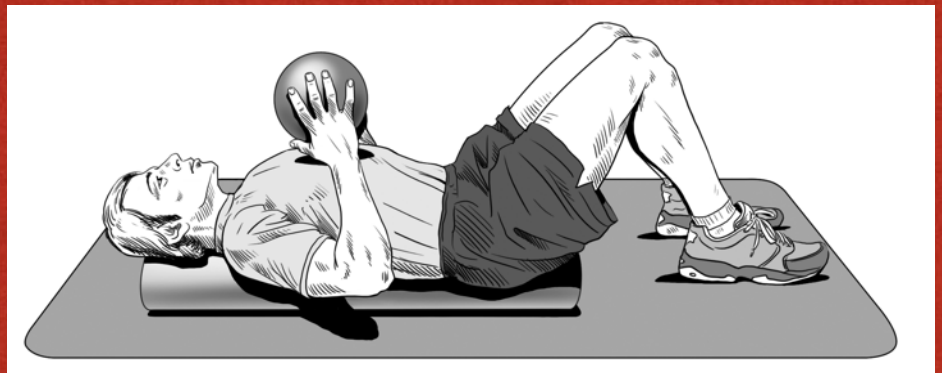


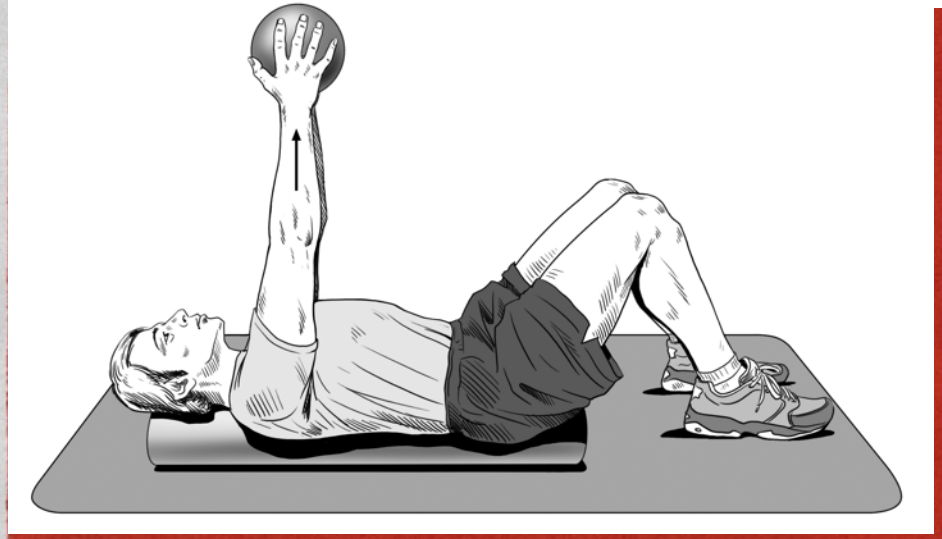
VERTICAL FOAM ROLL

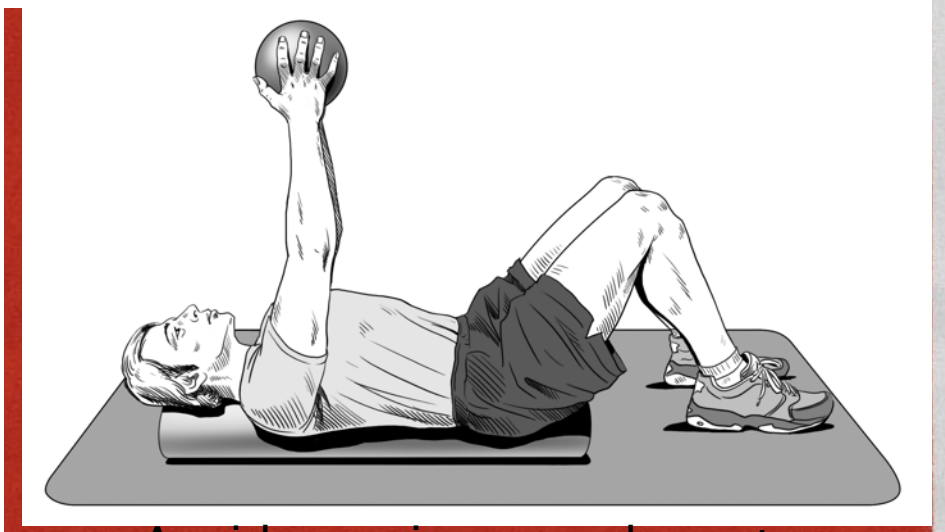


VERTICAL FOAM ROLL

CHEST PRESSES



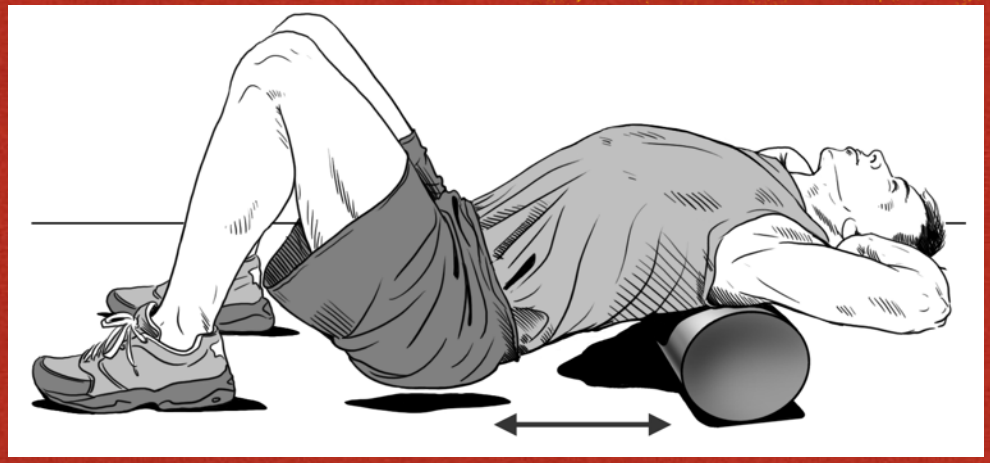




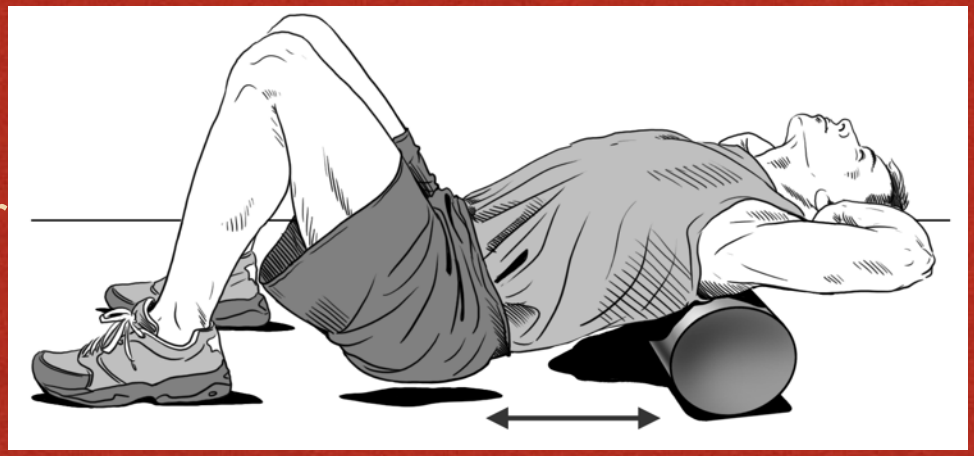
Avoid pressing up only part way

HORIZONTAL FOAM ROLL

- EXTEND YOUR BACK OVER THE FOAM ROLL
- KEEP YOUR CHIN TUCKED IN

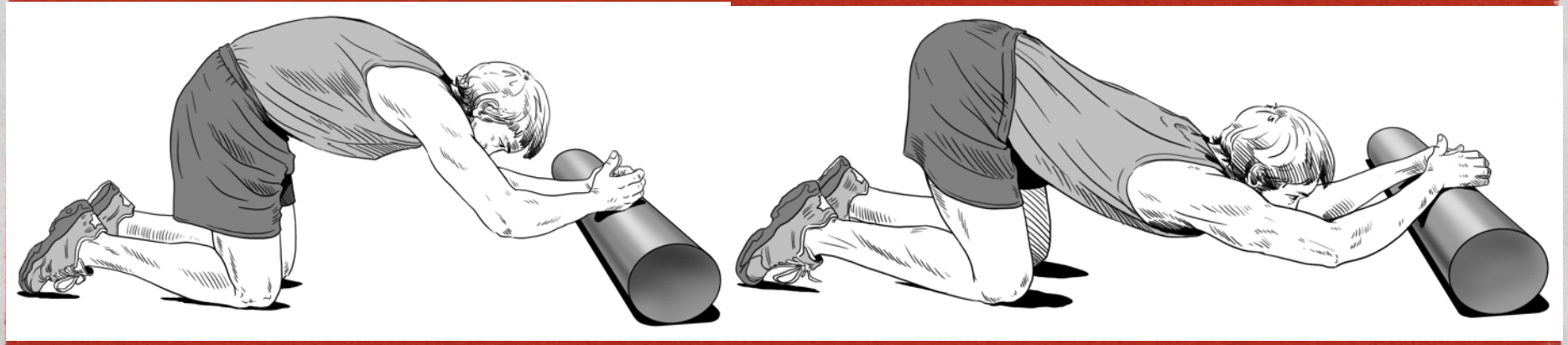


Avoid poking your chin



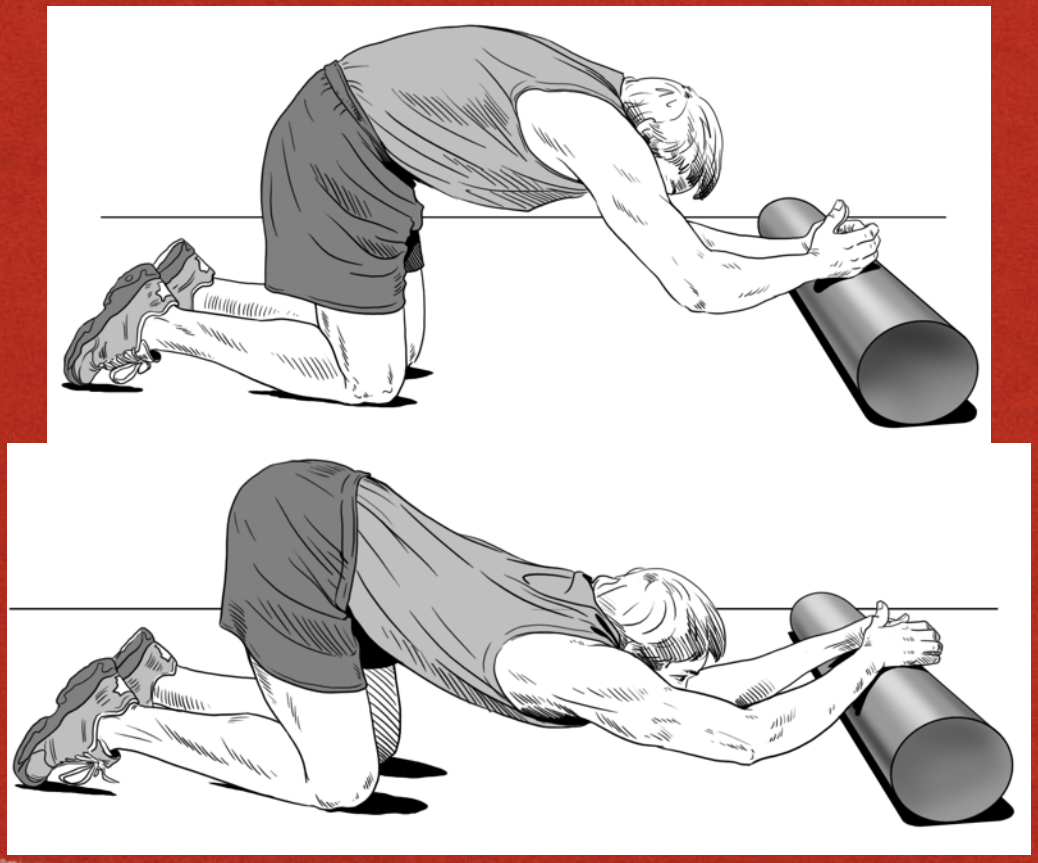
UPPER BACK CAT

- PLACE YOUR WRISTS ON THE FOAM ROLL
- ROUND YOUR BACK UP
- LET YOUR CHEST DROP DOWN



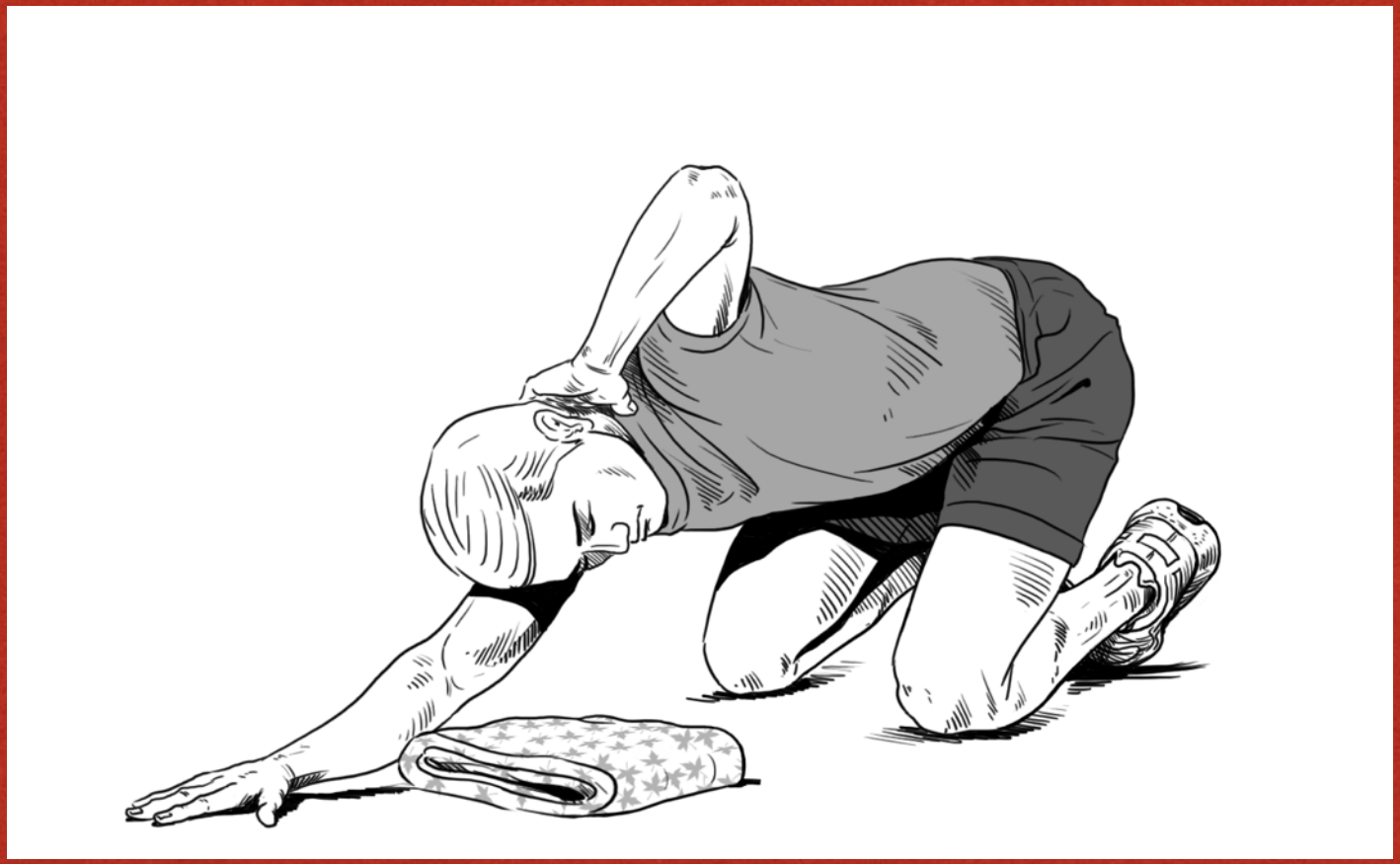
THE MOST COMMON MISTAKE TO AVOID

- SHRUGGING YOUR SHOULDERS

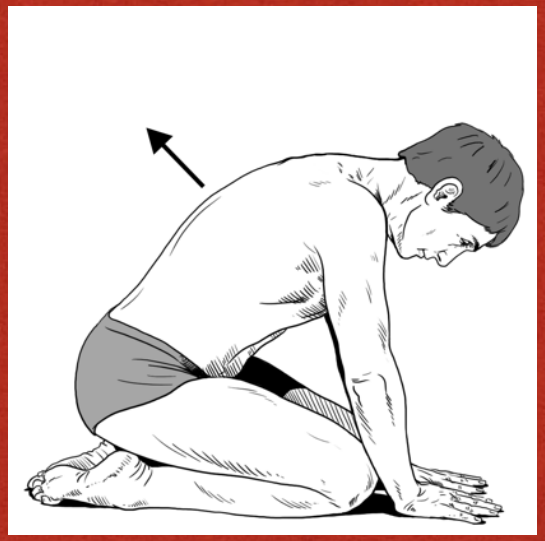


MID-BACK ROTATION
START POSITION

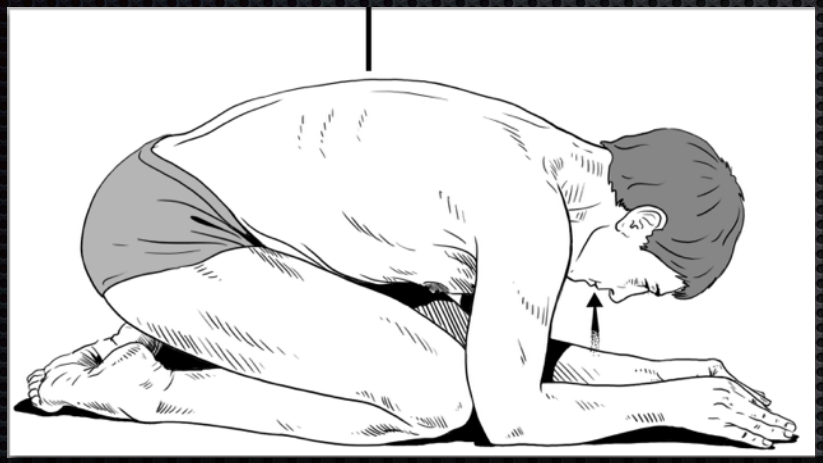
FINAL POSITION

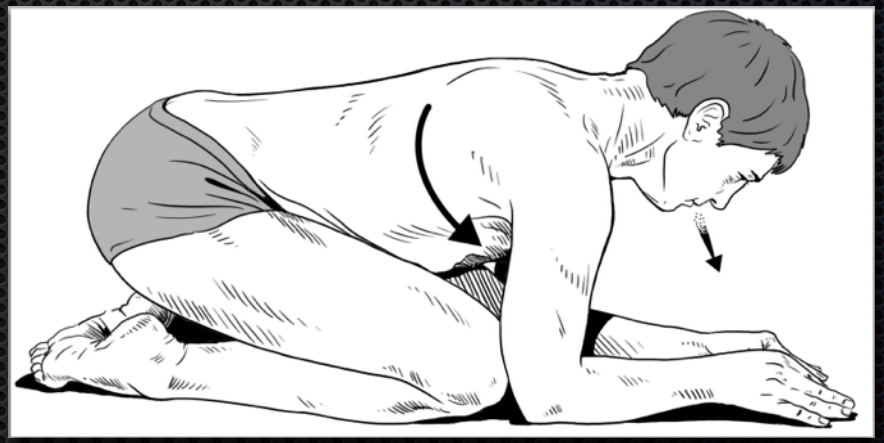


SPHINX – T4-8



Jiri Cumpelik, PT

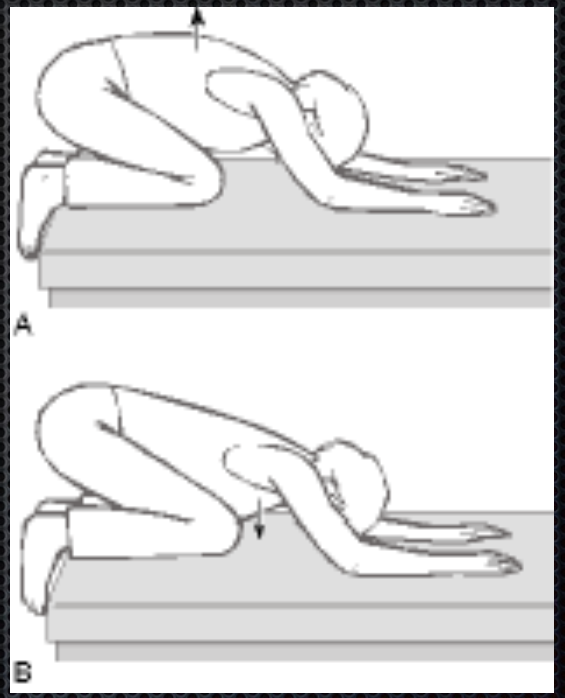




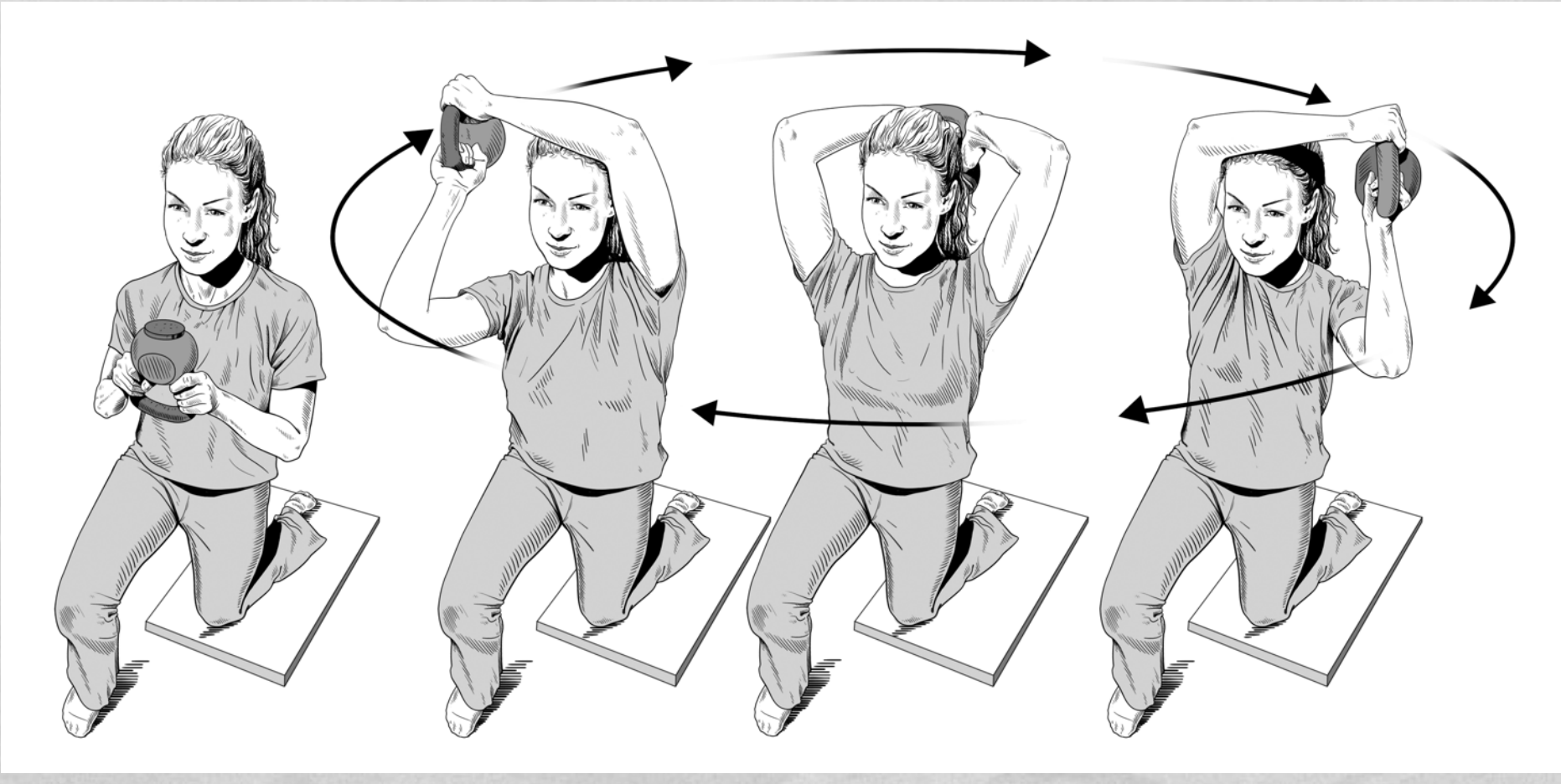
T4 Sphinx Progression

Kolar T4 Extension Prayer

- Knees abducted so pressure on medial condyle
- Pre-spring T4-8 into extension
- Actively bring sternum towards floor



THE HALO



Cressey Upper T-Spine Mob

Upper Body Book

DeFranca C, Liebenson C

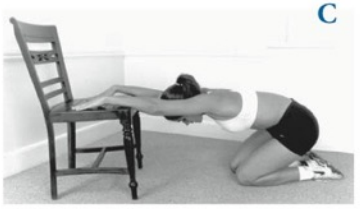
Exercise: Latissimus Dorsi Stretch

Purpose: This exercise helps to stretch the large Latissimus Dorsi muscle on the back and side of your torso.

Repetitions: 6-8R/1S; Perform slowly and progress to a 5 sec hold.

Description:

- Kneel with your forearms on top of a chair.
- Inhale and round your middle back towards the ceiling. (A) Exhale actively while dropping your chest towards the floor. (B)
- Once you are able to feel a gentle stretch through your middle and upper back, walk your knees in towards your chair so that your lower back rounds. (C)
- Level 2 - A more advanced stretch is performed with elbows bent. (D)



LEWIT'S T4 WALL LEAN

Press in Snatch

Sagittal

Press in Snatch

Sagittal

PIR Mobilization's from Lewit

ure 19.68 Upper rib PIR mobilization.

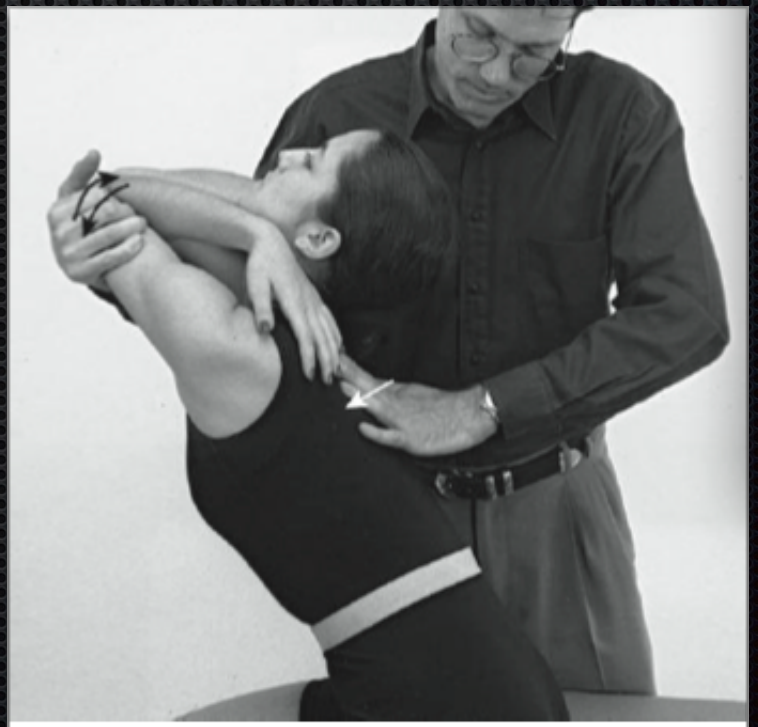
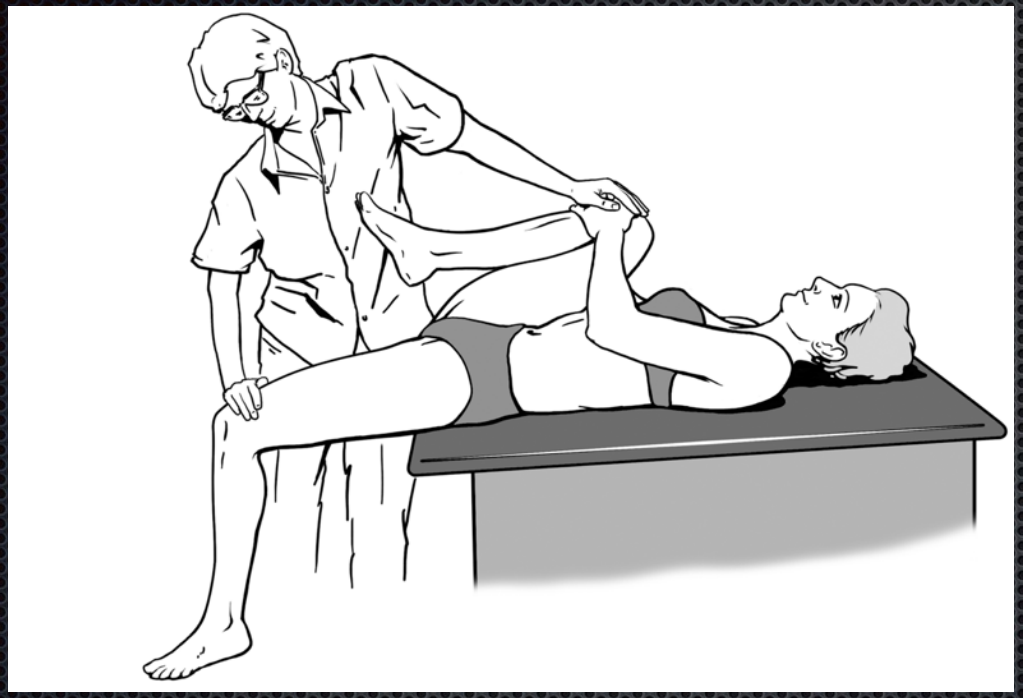
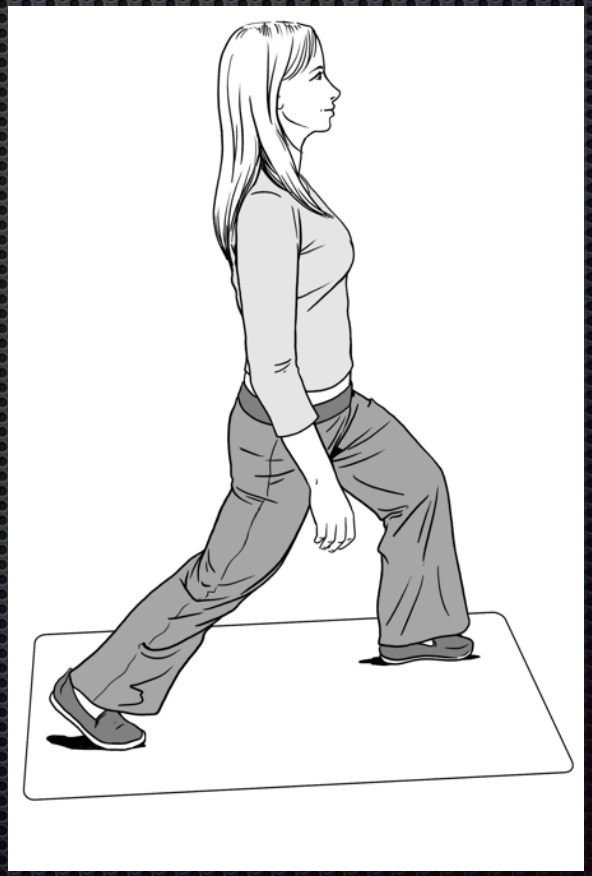


Figure 19.61 Thoracic spine extension PIR mobilization.

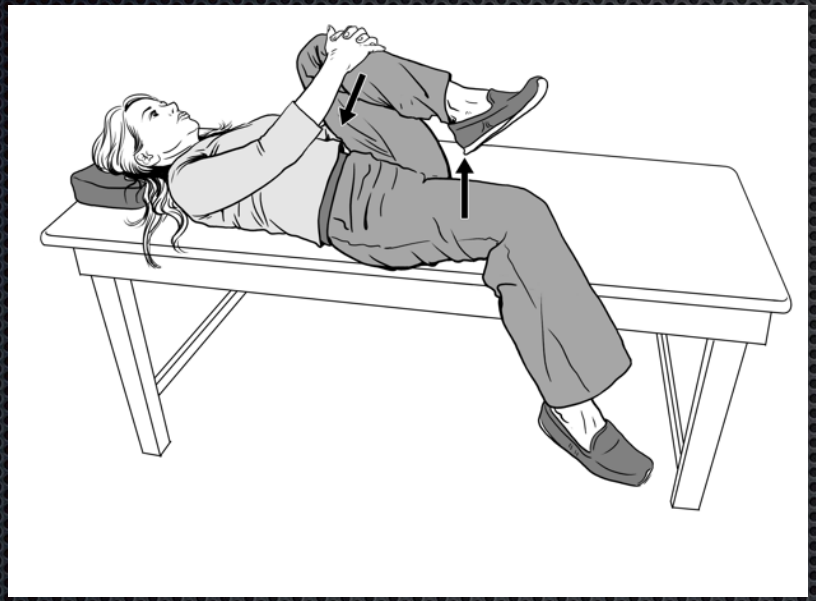
2. Hip Mobilizations

a) Psoas Stretch/anterior capsule



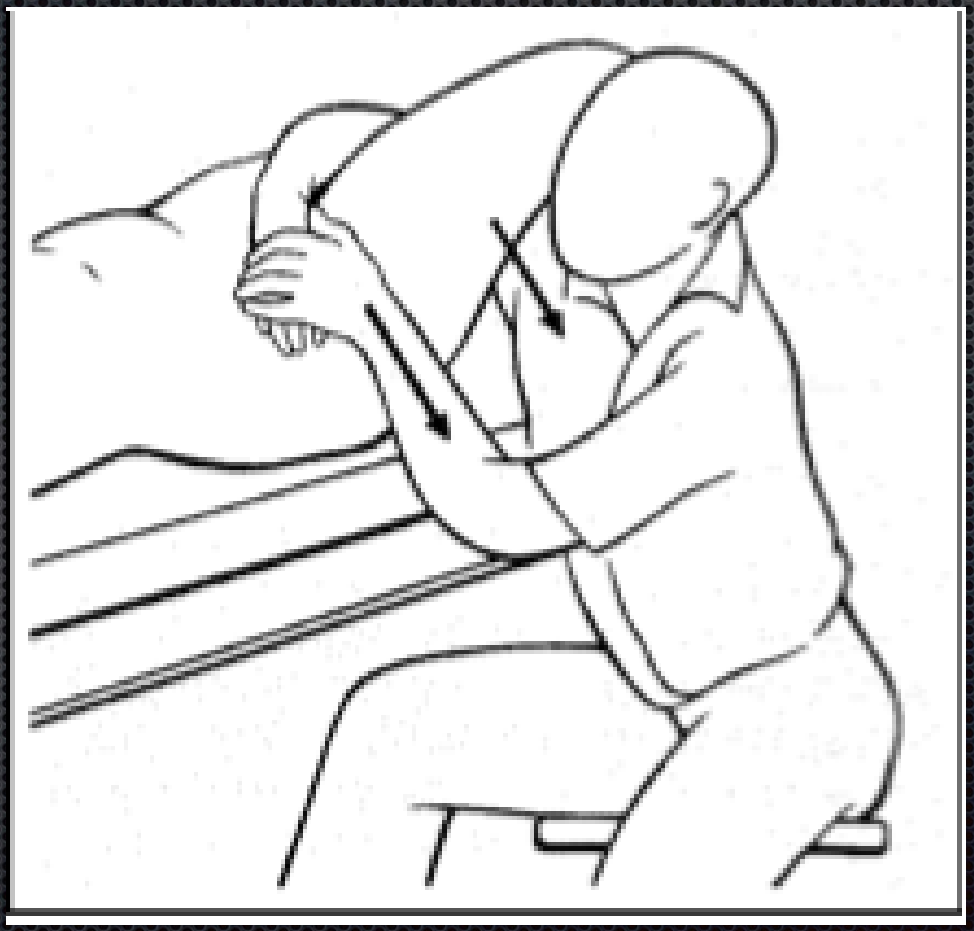


Supine anterior capsule mobilization

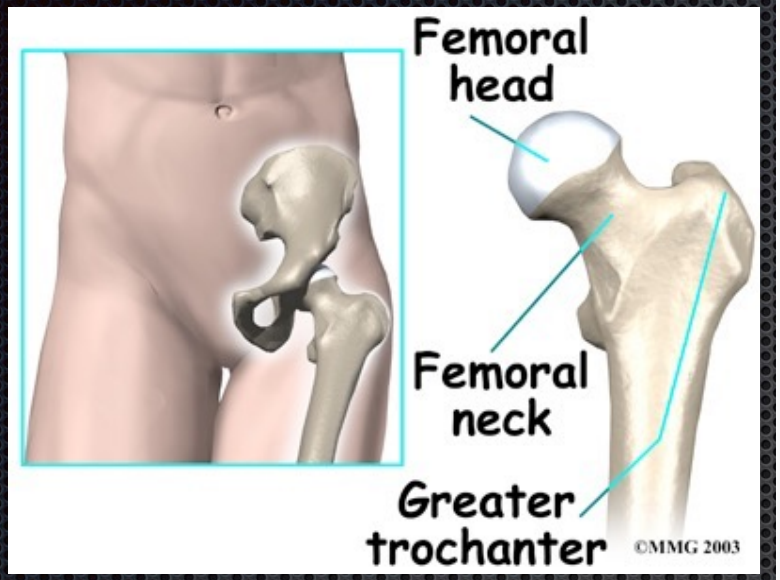


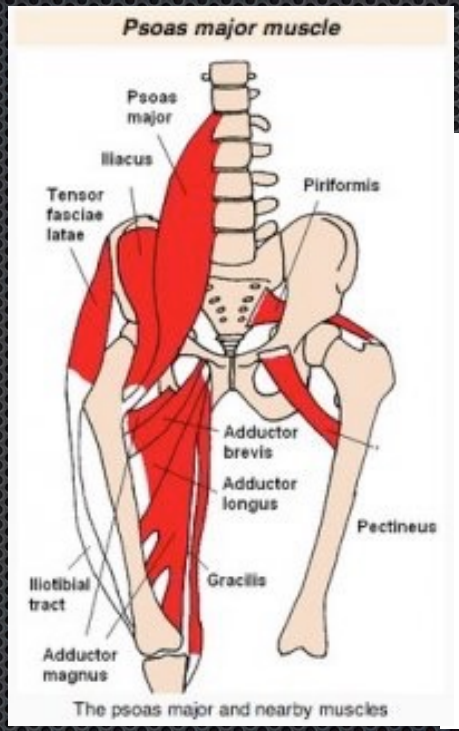
with slider

Lewit's Ant Hip Joint Mob



Anatomy


Femoral head
Femoral neck
Greater trochanter
©MMG 2003


Psoas major muscle
Psoas major
Iliacus
Tensor fasciae latae
Piriformis
Adductor brevis
Adductor longus
Pectineus
Gracilis
Iliotibial tract
Adductor magnus
The psoas major and nearby muscles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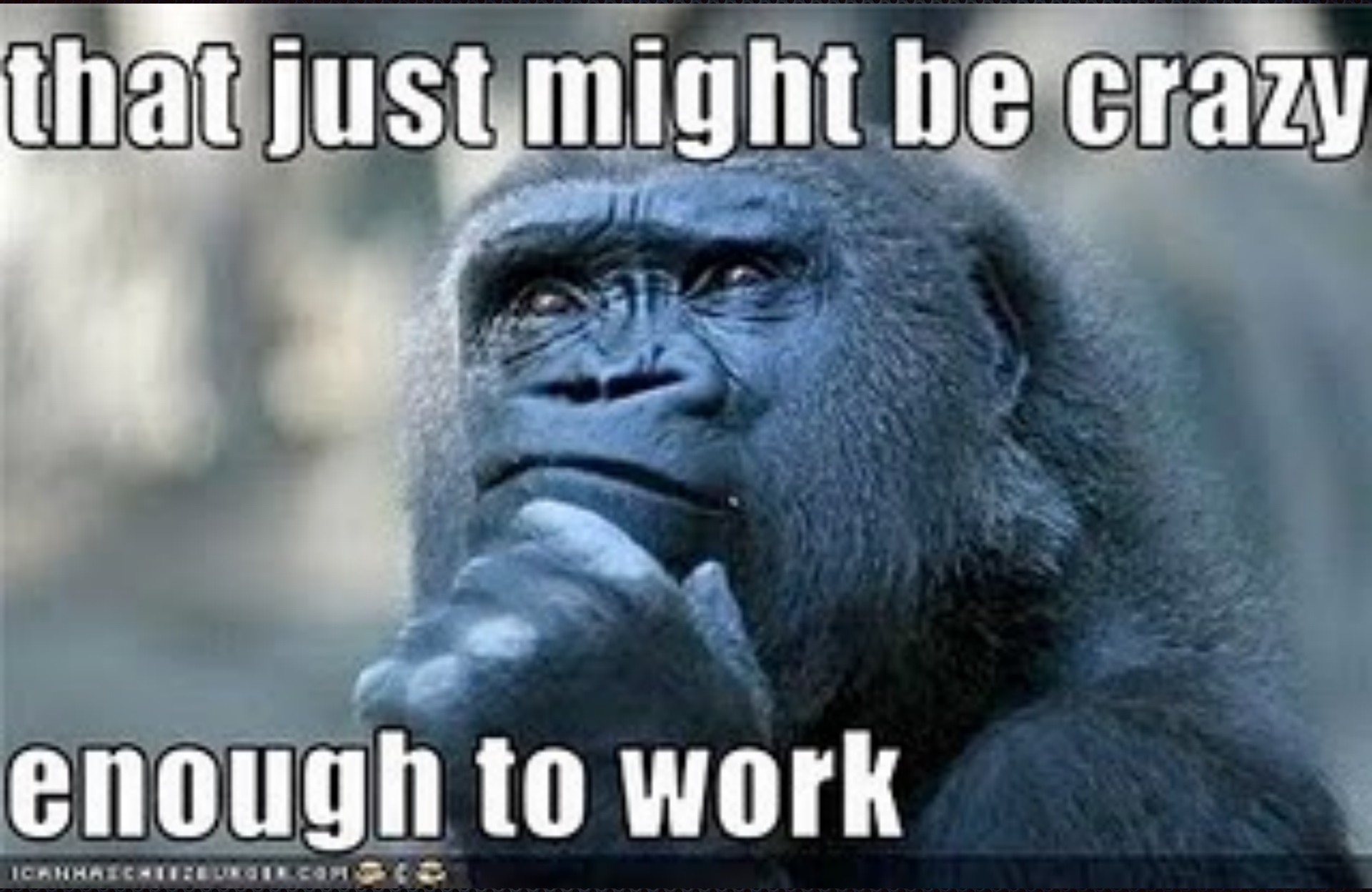
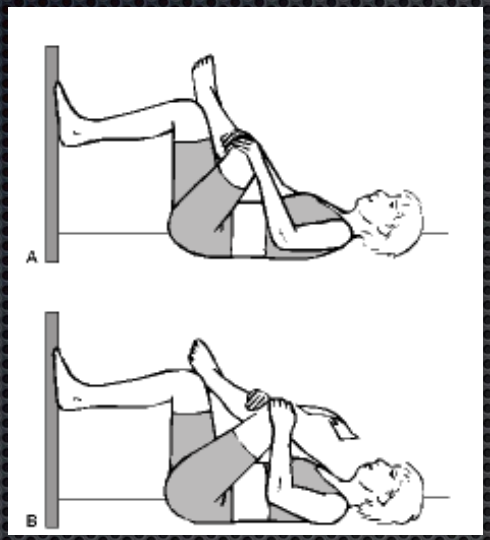
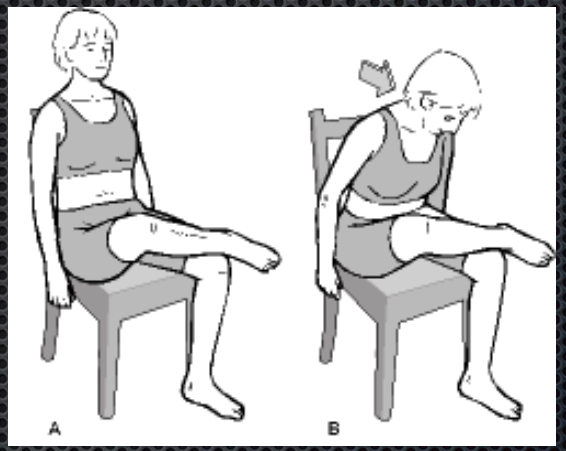
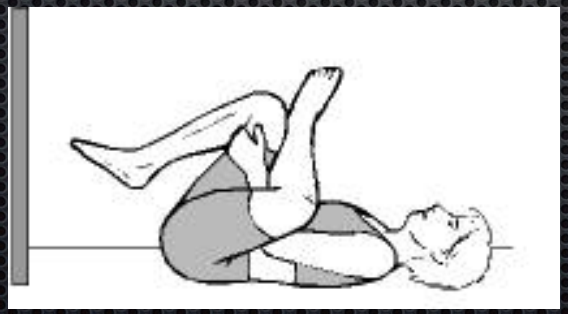

that just might be crazy
enough to work
ICANHASCHEEZBURGER.COM

b. Piriformis Stretch/Posterior hip capsule mobilization

Recumbent or Seated Piriformis/Posterior Hip







Sitting Back

3. Ankle Mobilizations

- **LEG SWINGS**

- Stand on 1 leg
- Balance grasping object in front
- Bend knee on raised leg
- Swing raised leg side to side
- Keep your foot planted
- As leg swings across body feel




3. Toe Mobilizations & Primitive Rest Poses

D) Spine Sparing Strategies

Why is sitting a pain in the butt?

Faulty Posture

Precautions

- Do patients get consistent or inconsistent advice about ADL's & their back?

ISCRS
INTERNATIONAL SOCIETY OF CLINICAL REHABILITATION SPECIALISTS

Precautions

- Prolonged sitting

- Early morning flexion

Precautions

- Lifting w/ end range flexion

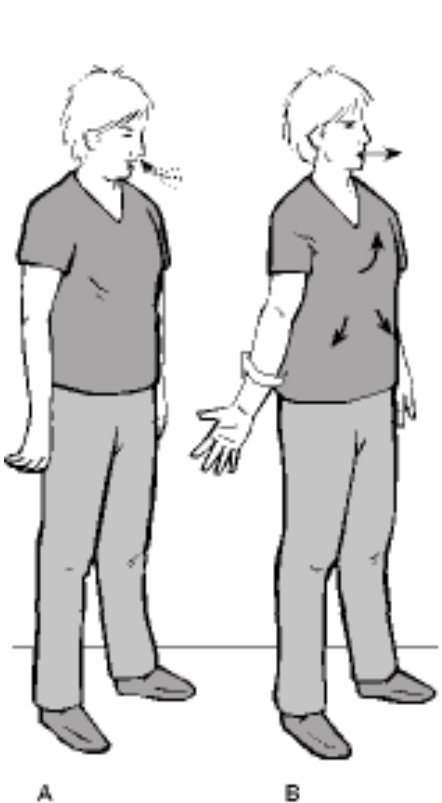
- Loaded exercise w/ end range flexion

Precautions

**“the first treatment is to teach the patient to avoid what harms him.” **

Karel Lewit

- Examples:

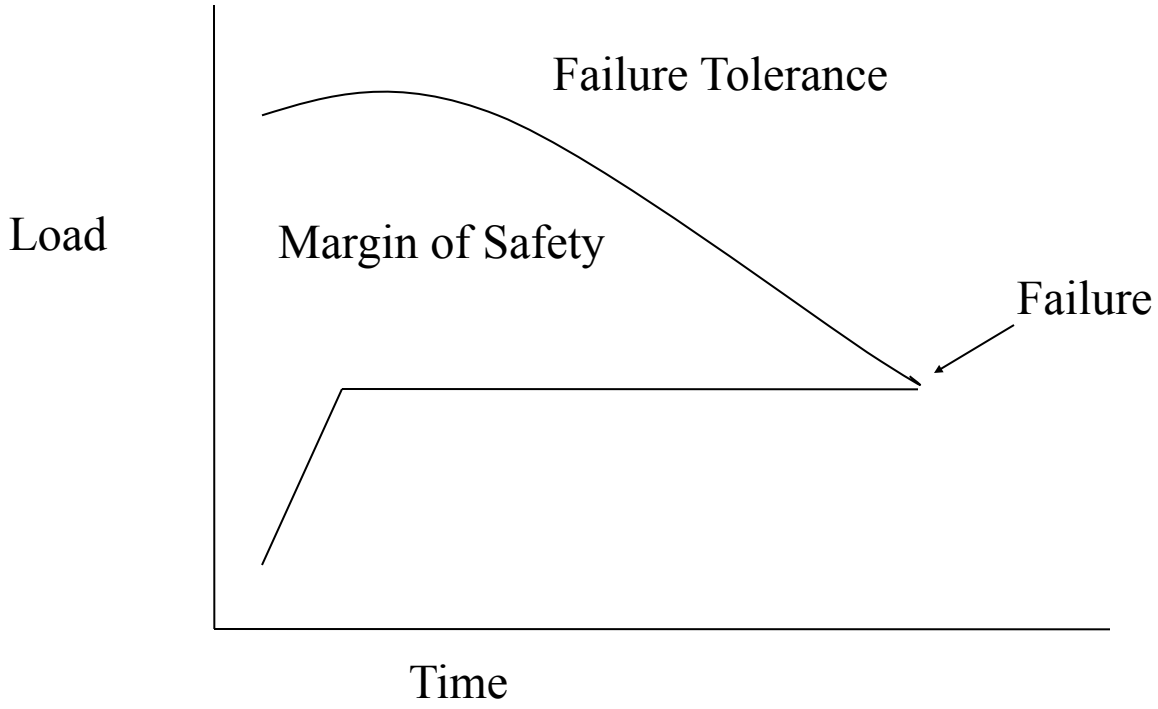


Why does my back hurt - I do 100 sit-ups every morning?

When is flexion the biggest danger?

- Stover Snook 1998

Prolonged end range loading



Derived from:

McGill S, Lower Back Disorders: Evidence-Based Prevention and Rehabilitation.

2002, Human Kinetics, Champlain, IL

1. Squat – p645

- Teach patient to spare their spine
- Use legs to get up & down from chair, bed, etc.
- Maintain upright spine position (neutral lordosis)

In Function

NSCA CEU QUIZ

Available at: http://www.nsca.com/Certification/Continuing-Education/CEU-Quizzes/

The Back Squat: A Proposed Assessment of Functional Deficits and Technical Factors That Limit Performance

Gregory D. Myer, PhD, CSCS*D,[1,2,3,4] Adam M. Kushner, BS, CSCS,[1] Jensen L. Brent, BS, CSCS,[5] Brad J. Schoenfeld, PhD, CSCS, FNSCA,[6] Jason Hugentobler, PT, DPT, CSCS,[1,7] Rhodri S. Lloyd, PhD, CSCS*D,[8] Al Vermeil, MS, RSCC*E,[9,10] Donald A. Chu, PhD, PT, ATC, CSCS, FNSCA,[10,11,12] Jason Harbin, MS,[13] and Stuart M. McGill, PhD[14]

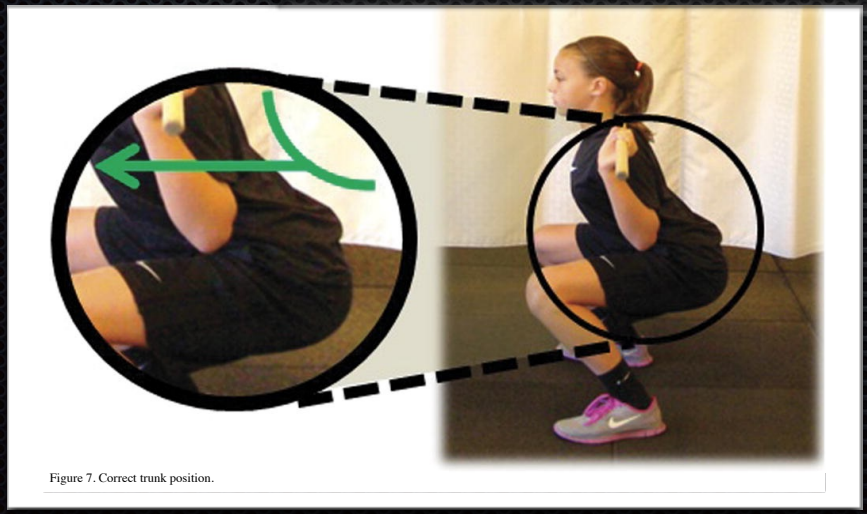


Figure 7. Correct trunk position.

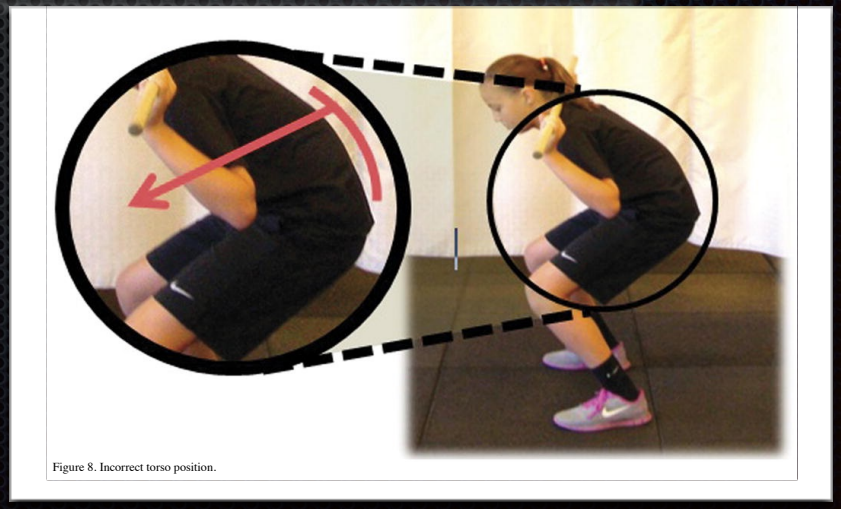


Figure 8. Incorrect torso position.

Developmental Kinesiology

Squat Training

2. Butt Wink

Aaron Lipsey w// Pr McGill

Choosing Optimal Hip & Foot Width for the Squat p 156 Pr McGill (4th ed)

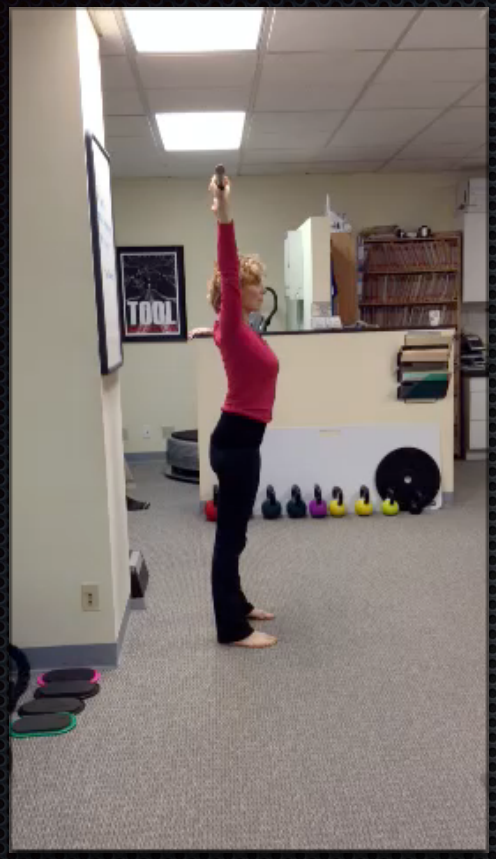
- Acetabular depth determines how deep one can squat
- Check for butt “wink”
- Mark angle where flexion 1st occurs
- Vary knee width to see where feet should be for ideal squat

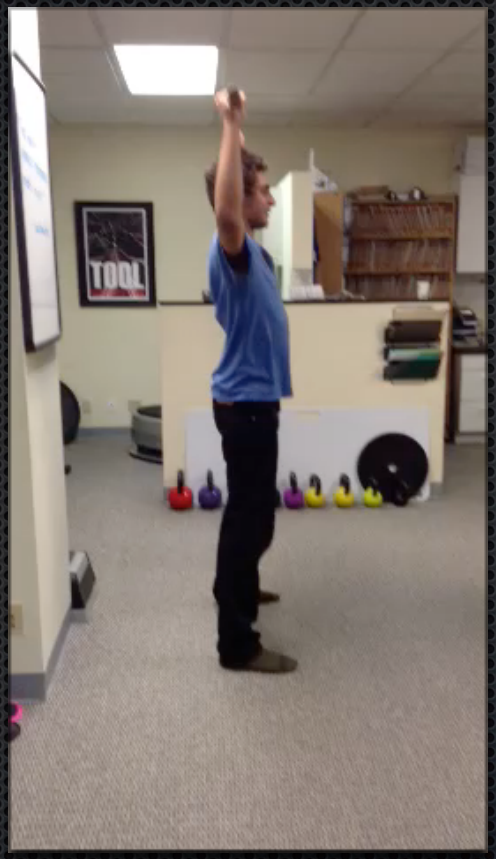
Tony Gentilcore

Neutral vs Tucked

Quad Rock

Squat Evaulations





3. The Hip Hinge – p304, 645

Dowel

Arm Rest/Box Squat


Rx'd 30:12

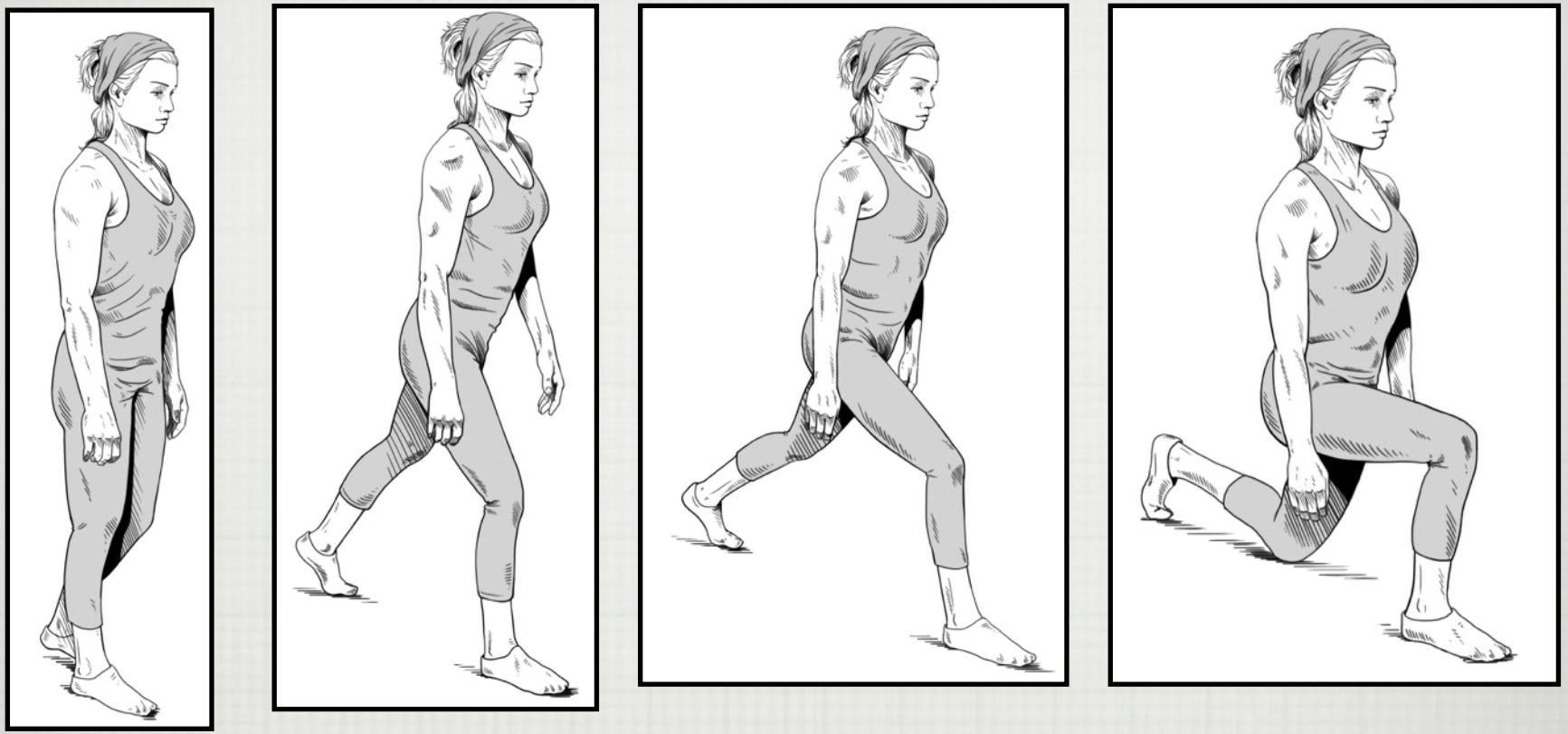
a) Waiter's Bow

Strength Circuit as an Evaluation Tool

Exercise/ Position	Dysfunction	Solution
Hang/Good Morning & Bent Over Row	Lose posture on initial movement = neurological	Waiters Bow into hang with stick on their back

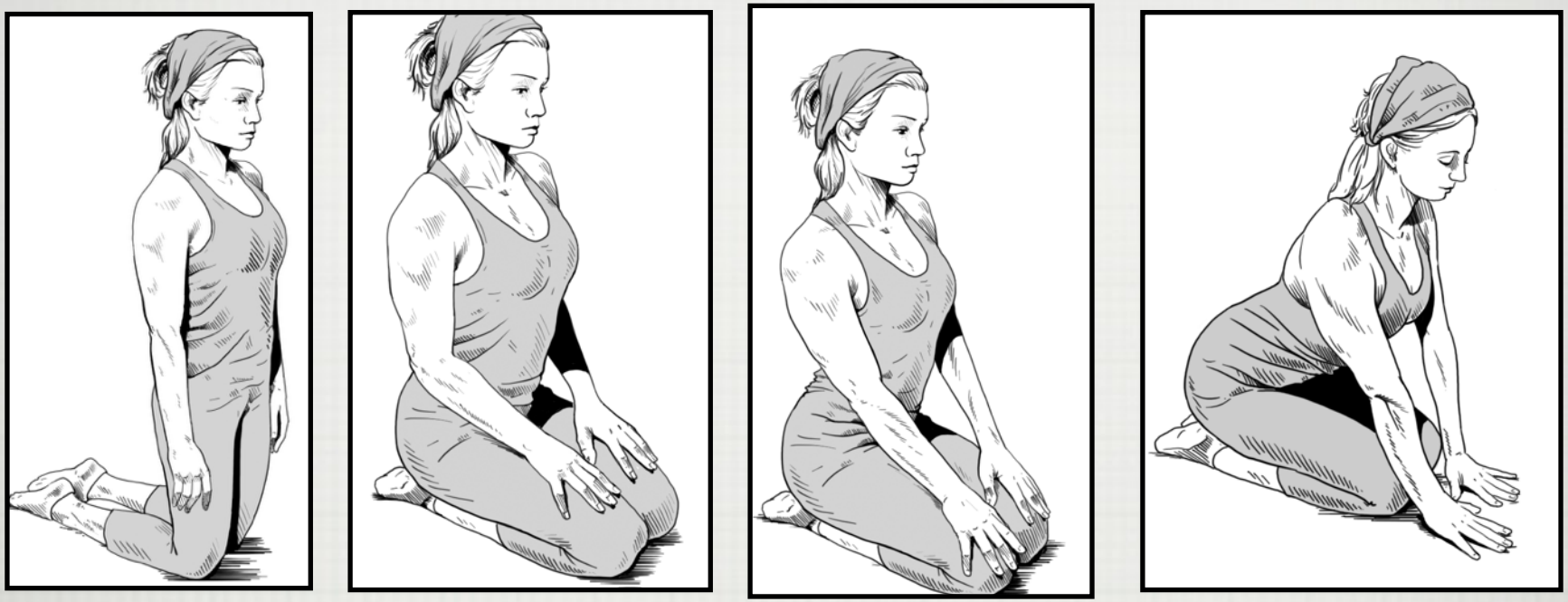
b) Short Stop

FIGURE 16-16. Short stop squat, a core exercise. This drill is used to perfect the hip hinging mechanics for greater power production. (A) The hands are placed on the thighs. (B) The hands slide down the thighs with the hips translating back rather than the knees forward. Here, the weight is carried down the arms as the body is stiffened and compressed with neutral spine curves. (C) Maintaining this compression, the hands slide lower to grip the bar.



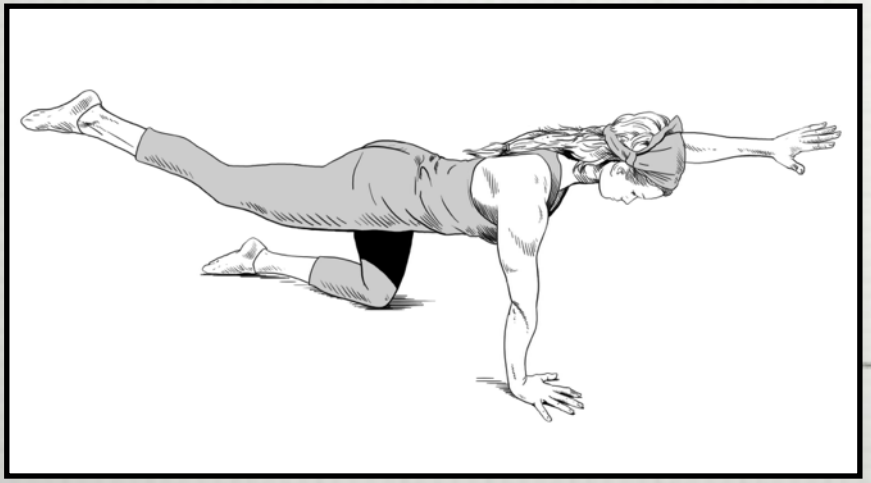
c) Reverse Lunge to Kneel

d) Tall Kneeling Hip Hinge

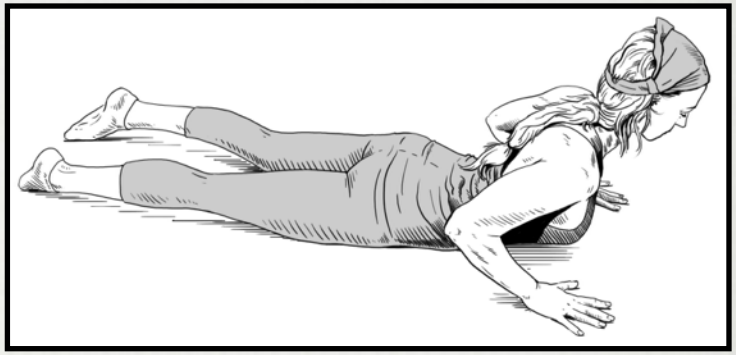


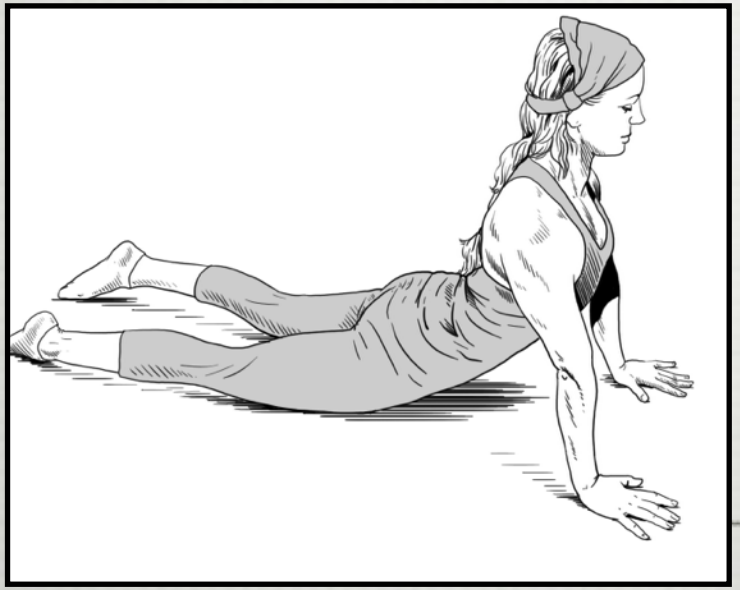
e) Tall Kneeling to Sphinx

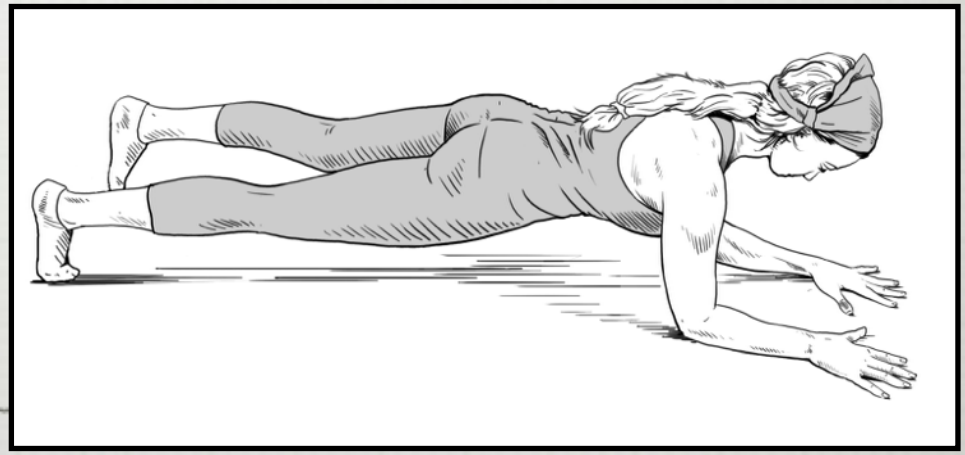
f) Kneeling to Quadruped to Bird Dog



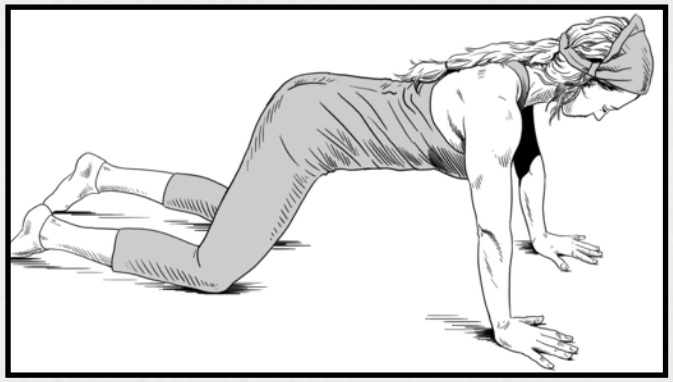
g) Sphinx to Cobra to Plank





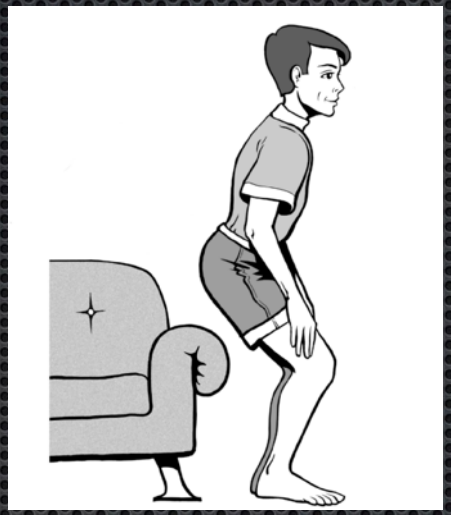


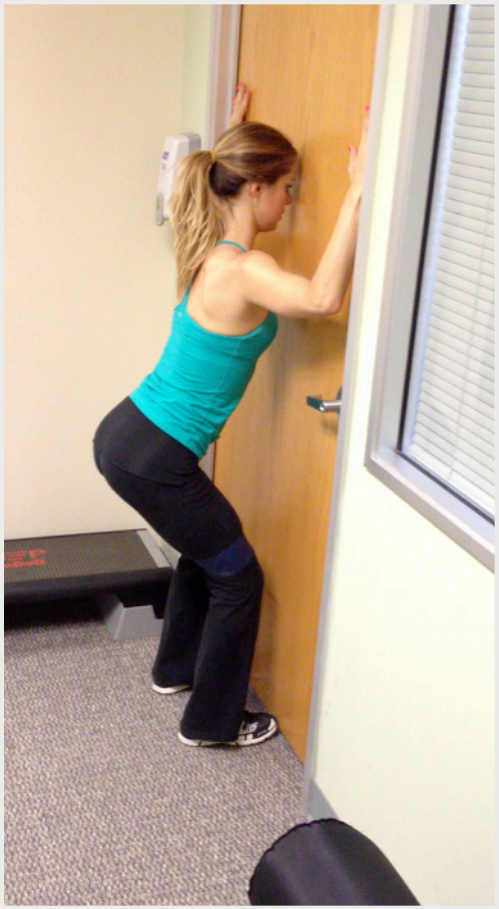
h) Quadruped to Kneeling to Standing

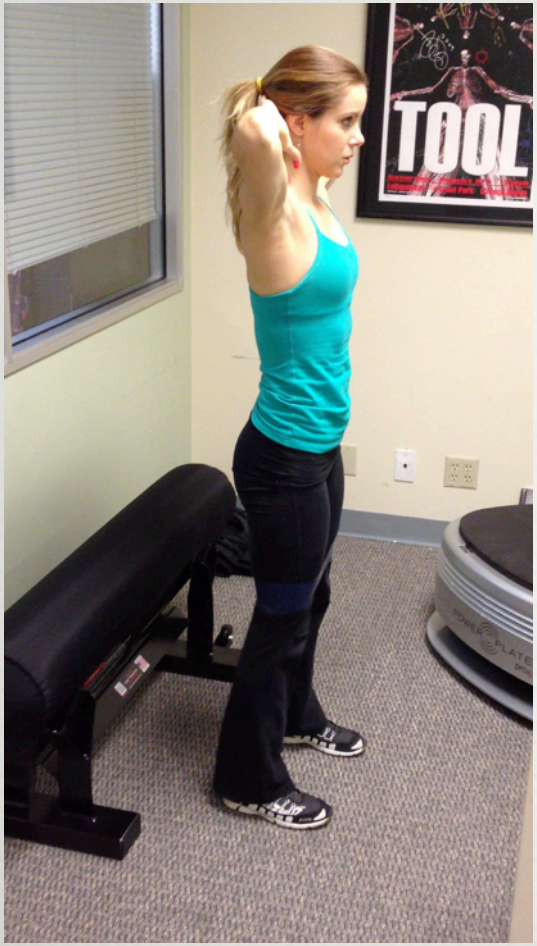


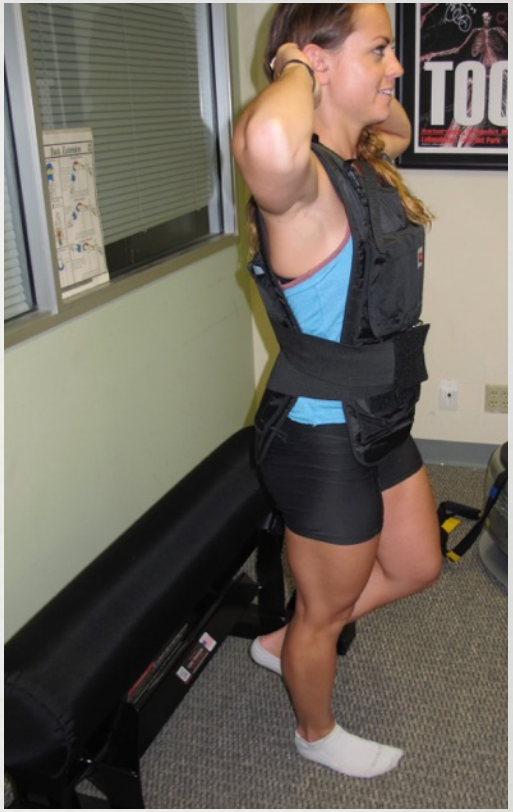
i) Up/Down Chair & Beginning Squat Training

- Box Squat (arm rest)
- Manual Resistance

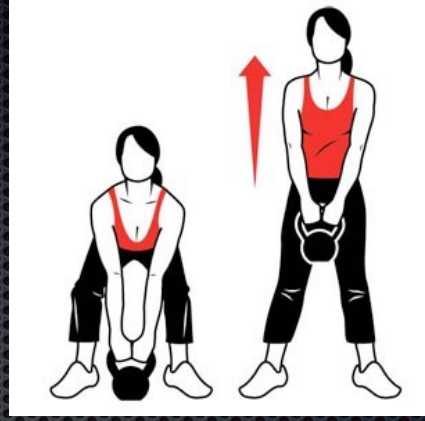






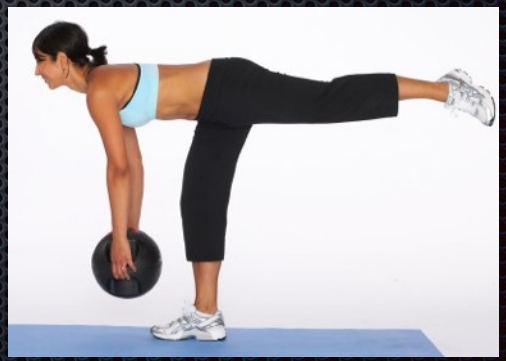


BOX SQUATS



4. Dead Lifts

Anti-Flexion - Post Chain Exercise



Sagittal

Sagittal

Resisted Dead Lifts

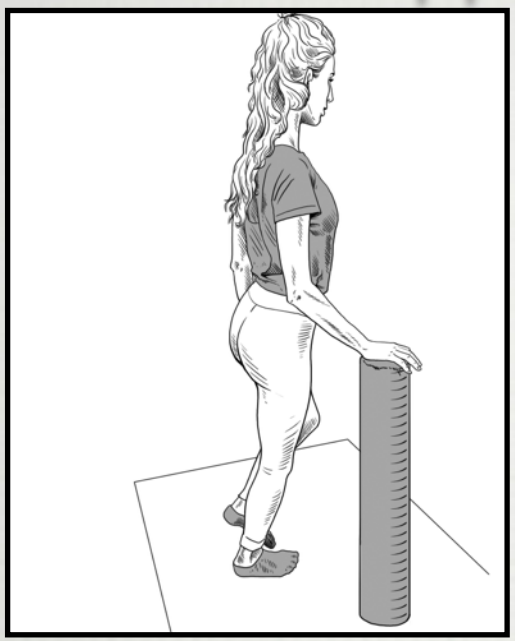
1LDL

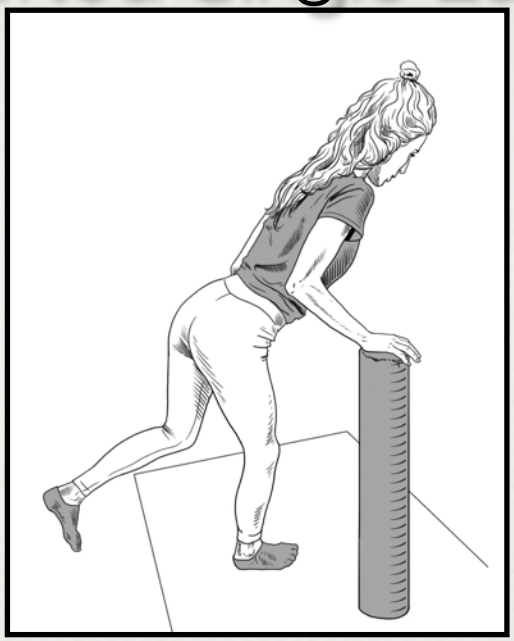
Teeter

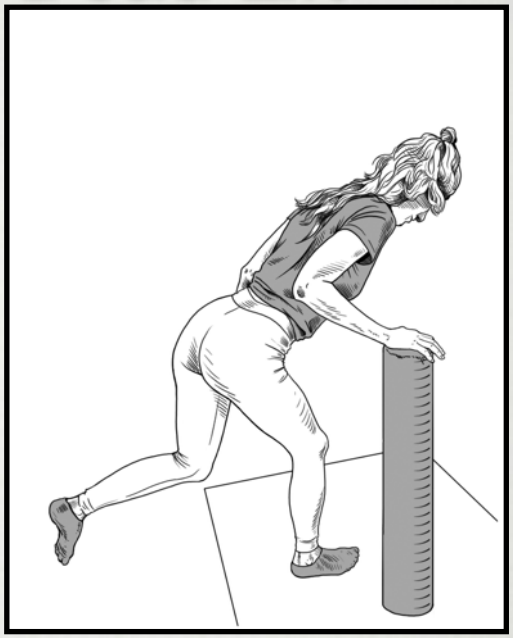
Keys

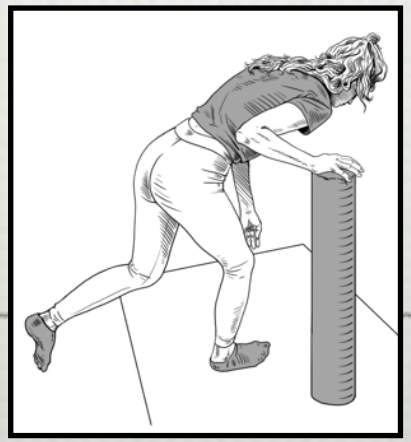
- Hinge from hips
- Maintain a vertical tibia!
- Feel hammies working throughout
- Don’t lock-out knees
  - Maintain at least slight knee flexion
- Maintain slight lumbar lordosis
  - Avoid rounding lower back

Supported Single Leg Dead Lift

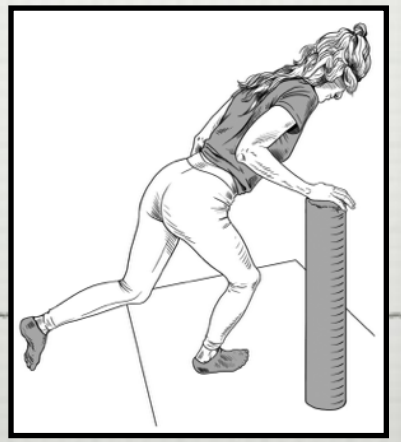








Trunk Flexion



Knee Forward

Reactive Single Leg Dead Lift