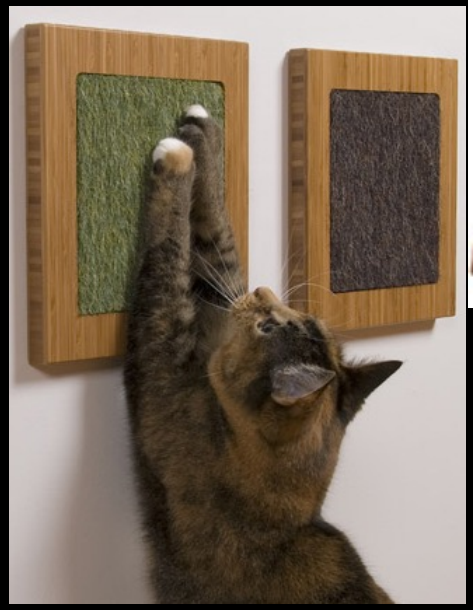
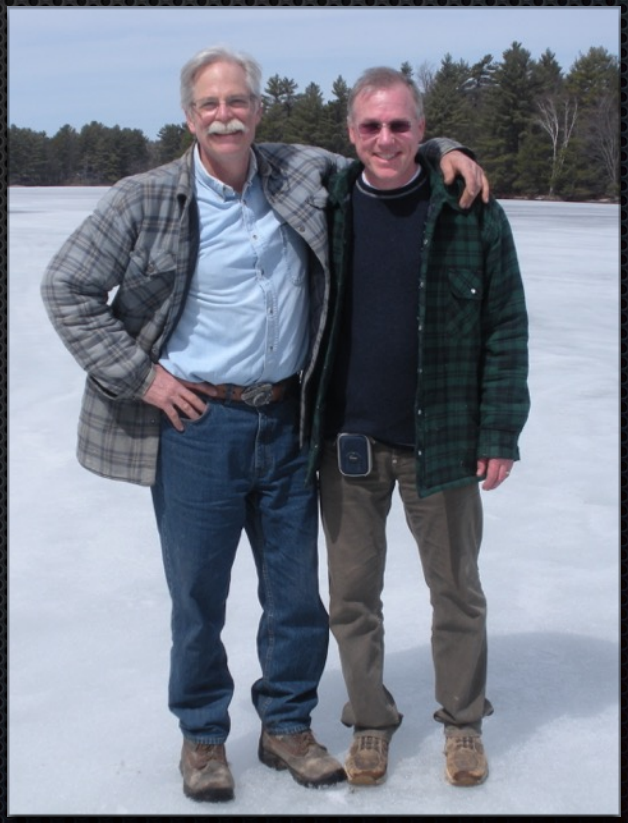
III）身体の“チューニング”を合わせる

- 回復戦略
- アクティブリカバリー
- モビリゼーション
- 脊柱温存



Stuart McGill, Ph.D.

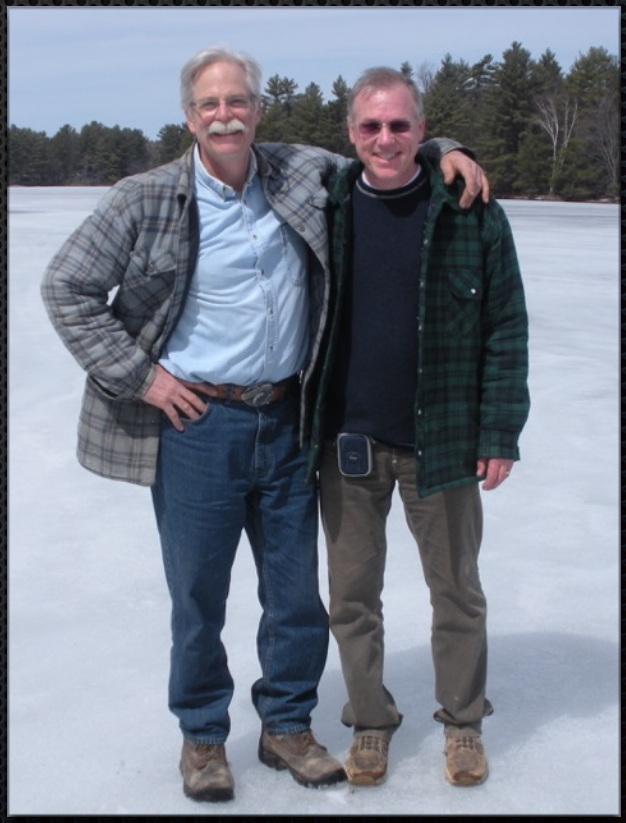
“障害予防戦略の目的は負荷への露出から得られる刺激による組織の適合 のペースを確実に保ち、理想的にはそれが蓄積された組織の損傷を超えることである”



自分を責めないこと - 一生トレーニング - 継続維持できる方法でのトレーニング - 自分自身の怪我と経験から学ぶこと

Stuart McGill, Ph.D.

“50代前半までにできるだけのアスレチシズムを残したまま引退をすることを決心した”

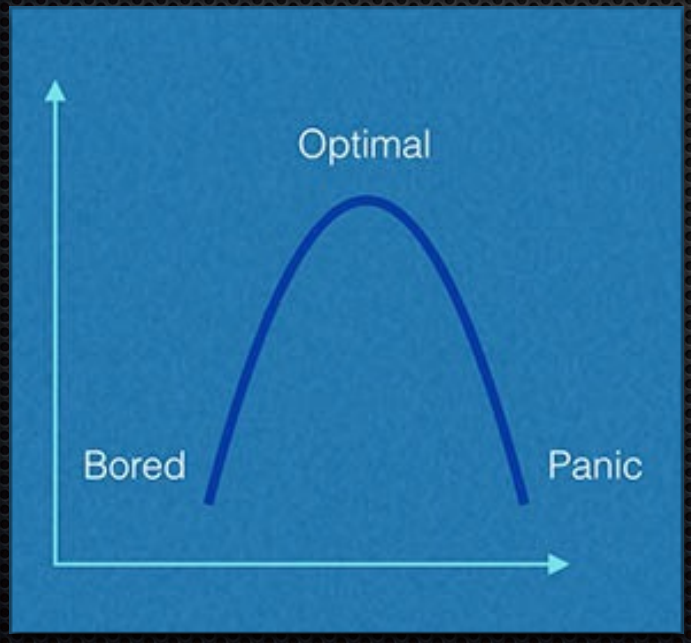


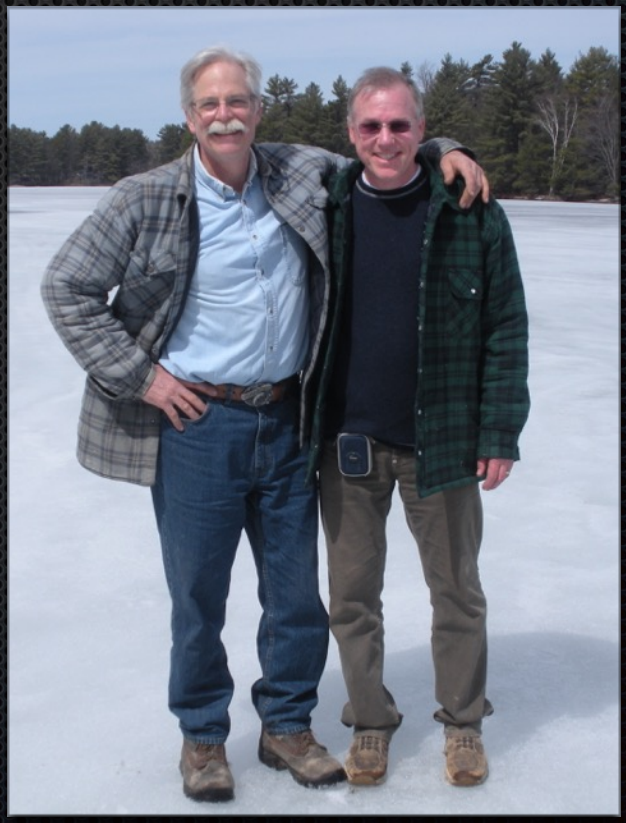
遊び終わった時にやりたいことができるようにトレーニングをしよう。自分の弱点(クリプトナイト）を見つけて受け入れ、それを改善する努力をすること。

60 is the new 40

Stuart McGill, Ph.D.

“これは中庸によってのみ達成される”





A)回復戦略

“回復は主なる制限要素である” - Mark Verstegen

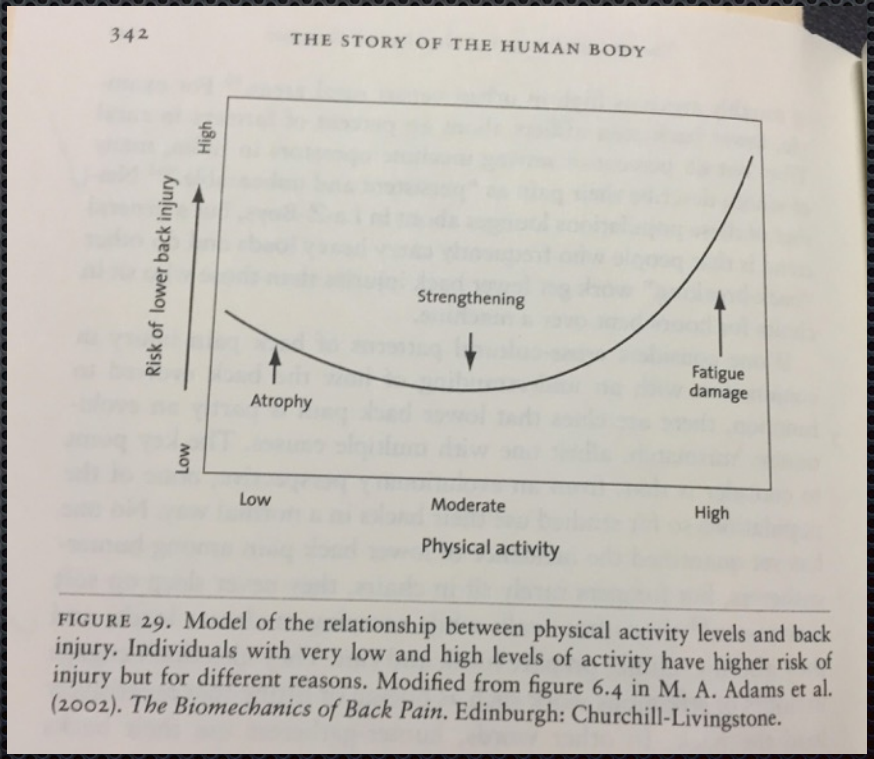


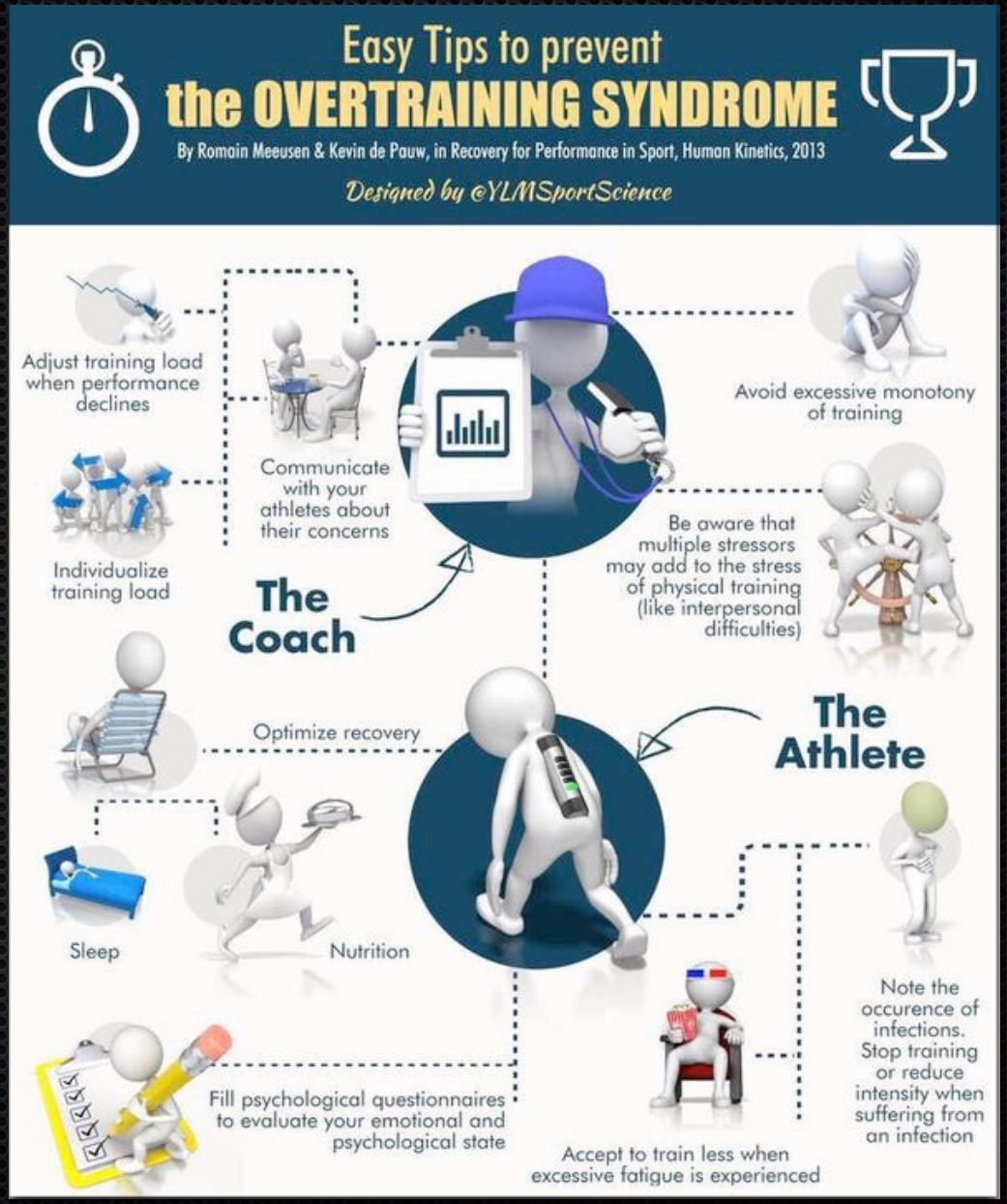
FIGURE 29. Model of the relationship between physical activity levels and back injury. Individuals with very low and high levels of activity have higher risk of injury but for different reasons. Modified from figure 6.4 in M. A. Adams et al. (2002). *The Biomechanics of Back Pain*. Edinburgh: Churchill-Livingstone.

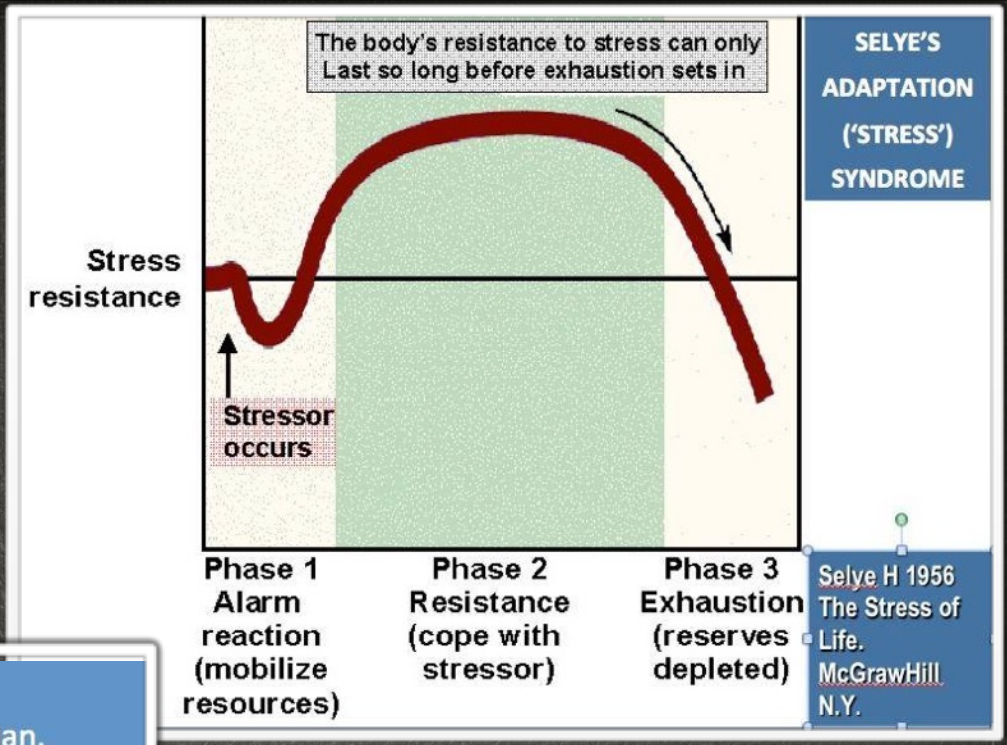
コーチ

- パフォーマンス低減時にトレーニング負荷を調整する
- 個別化したトレーニング
- マンネリを避ける

アスリート

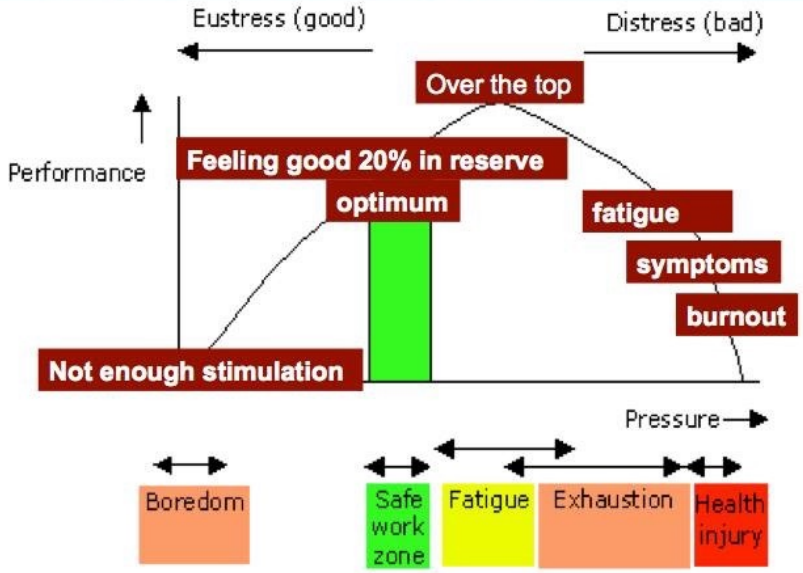
- 睡眠／栄養
- 疲労時にはトレーニングを減らす





The Human Function Curve

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



ダマクルの剣:
才能ある者のパラドックス

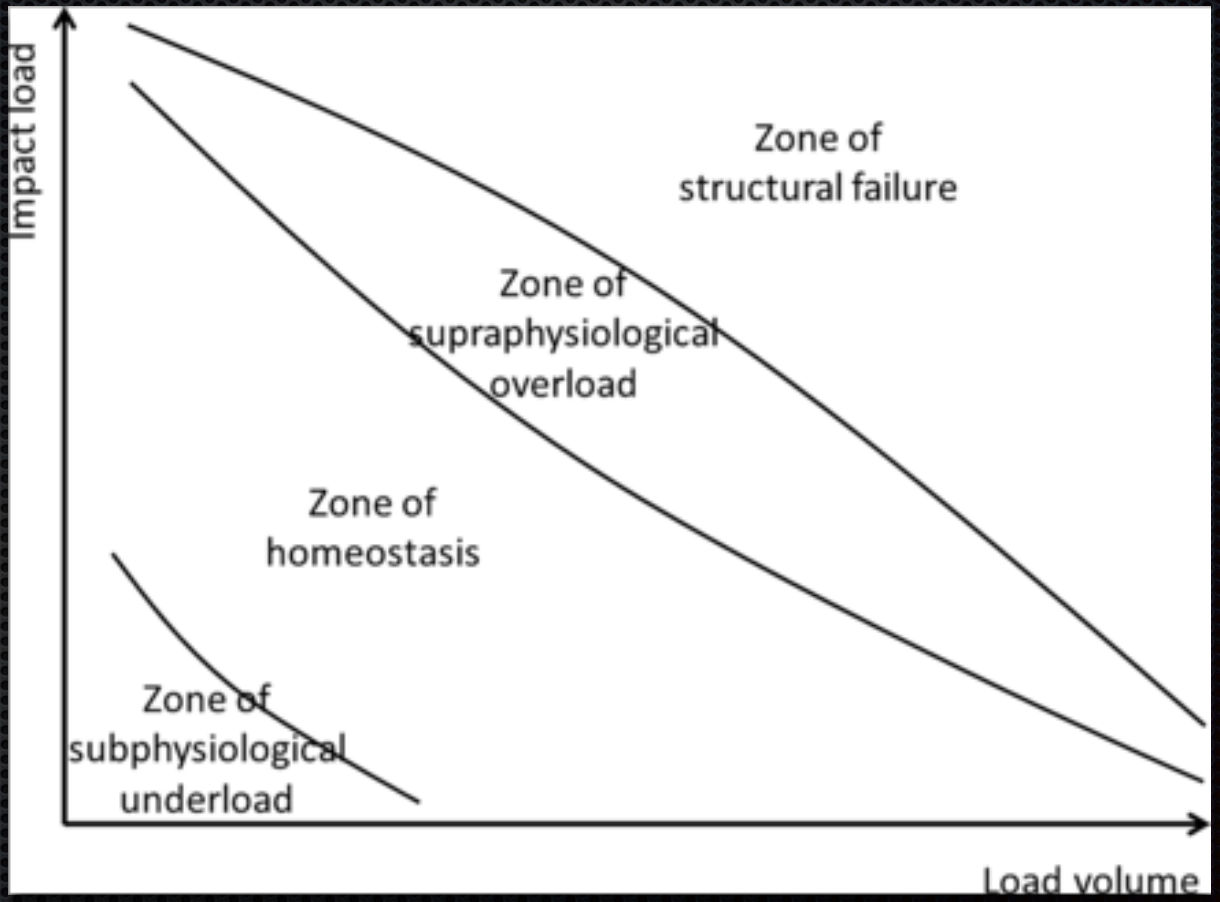
Charlie Francis

- ”90％の時間はアスリートがオーバートレーニングにならないように控えさせて、彼らにもっと頑張るようにとモチベーションを高めるのは、たった10%だけだ。”

身体構造の適合と負荷の関係性 (Dye 2005)

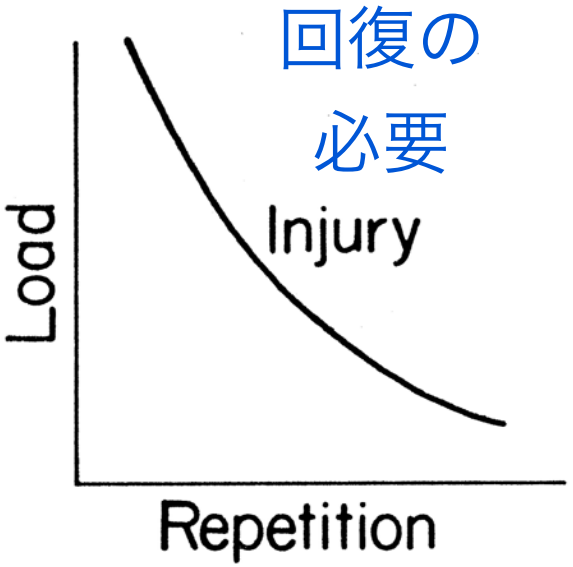
衝撃負荷:

投げるスピード、
ジャンプの高さ、
あるいは関節負荷の
その他の計測

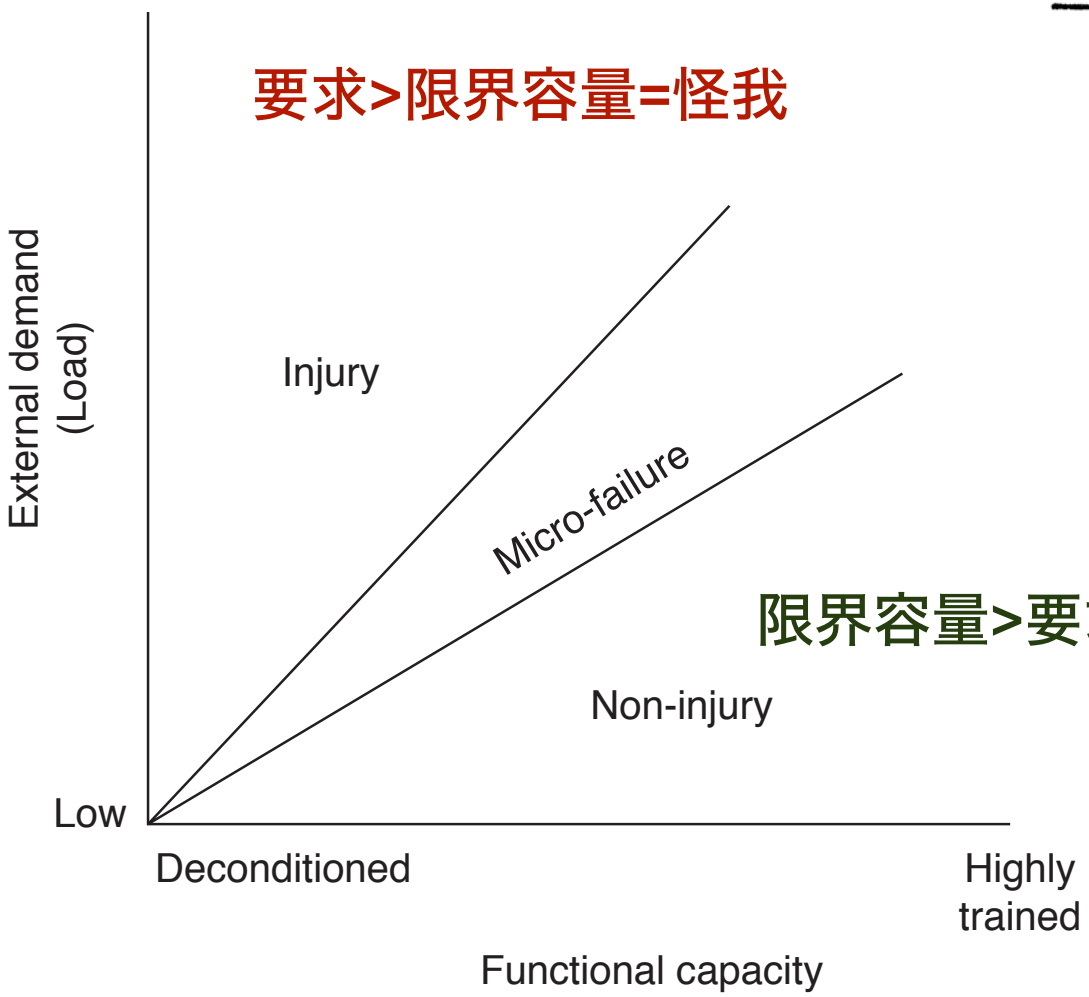


負荷量: トレーニング量（頻度、継続時間、強度）
適合した頻度など

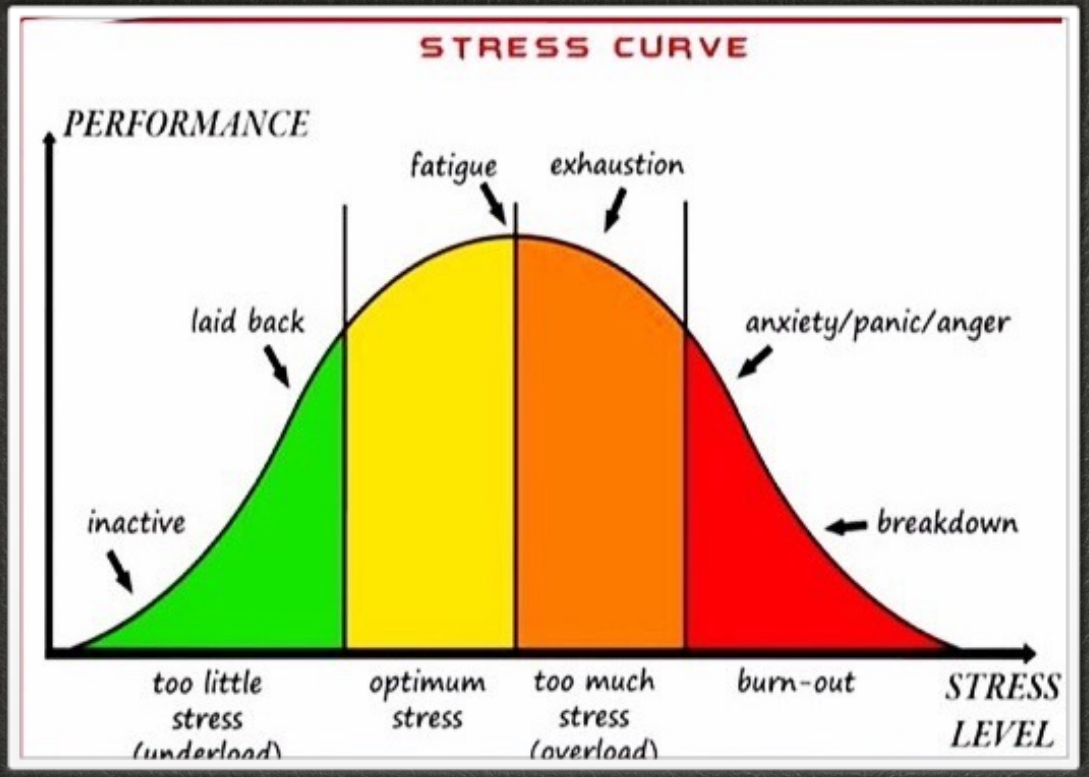
組織耐性



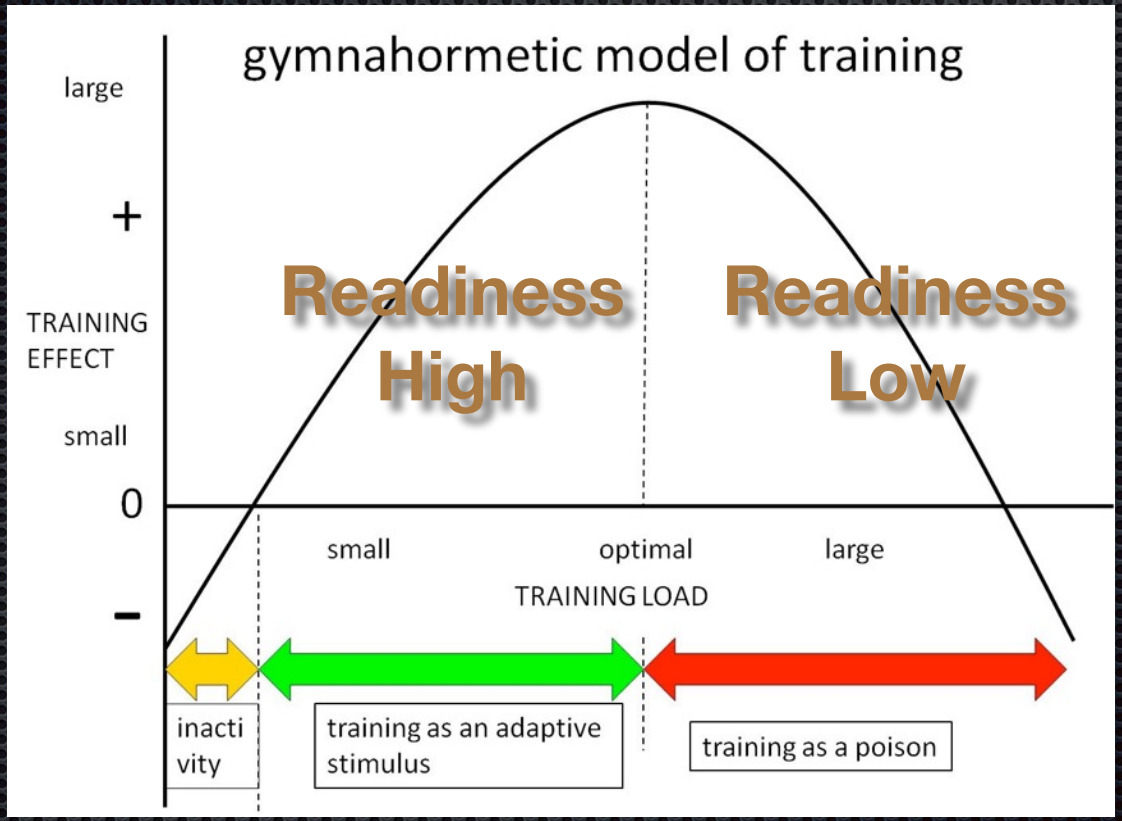
要求>限界容量=怪我



限界容量>要求=頑丈さ


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

トレーニング:
頻度、強度＆量

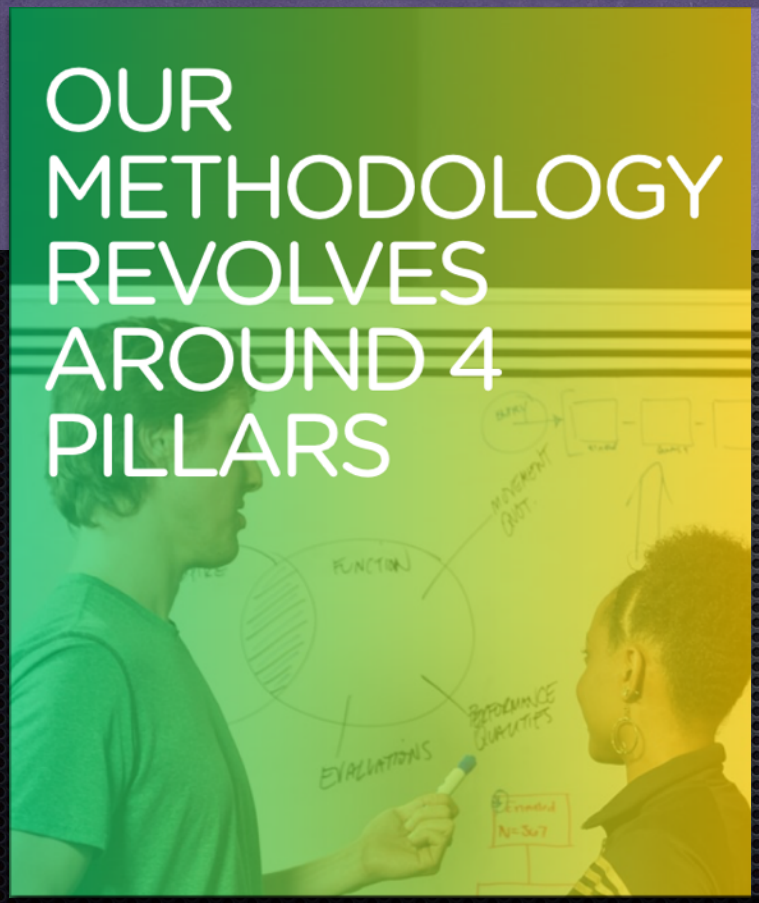


Henk Kraaijenhof

EQUINOX

EQUINOX

Philosophy



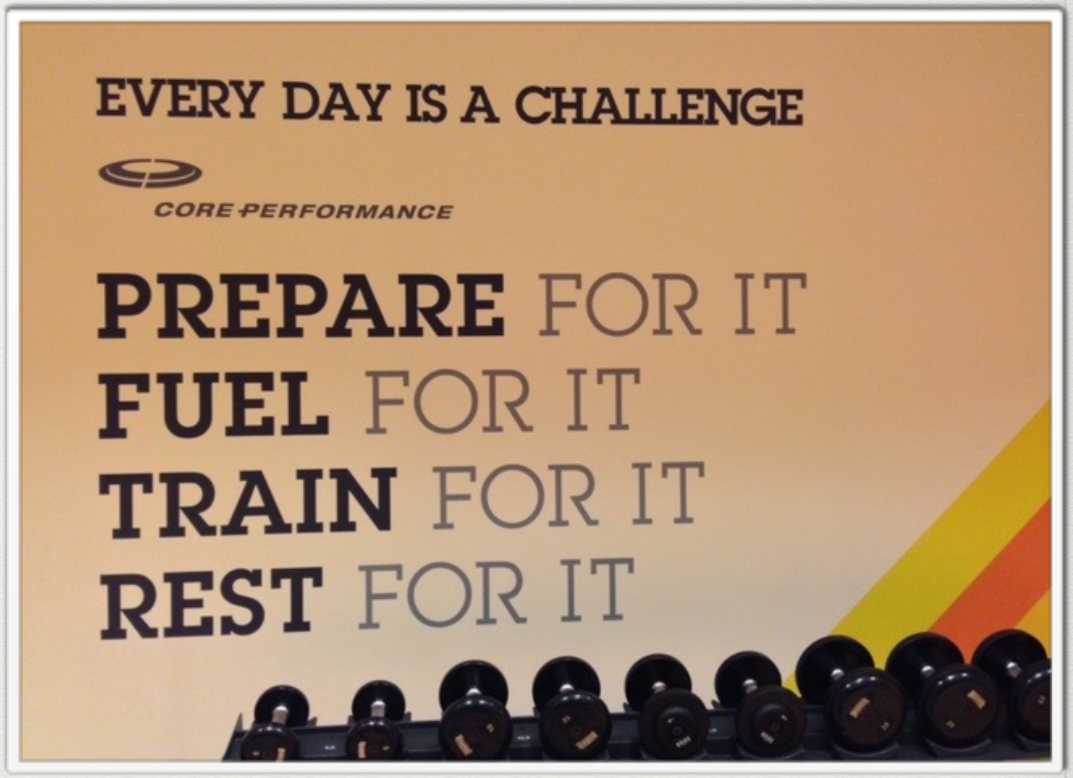
THE BROAD ELEMENTS OF A TRAINING PROGRAM CAN APPLY TO ANYONE. CONCENTRATE ON YOUR MINDSET, NUTRITION, MOVEMENT PATTERNS, AND RECOVERY.

MARK VERSTEGEN

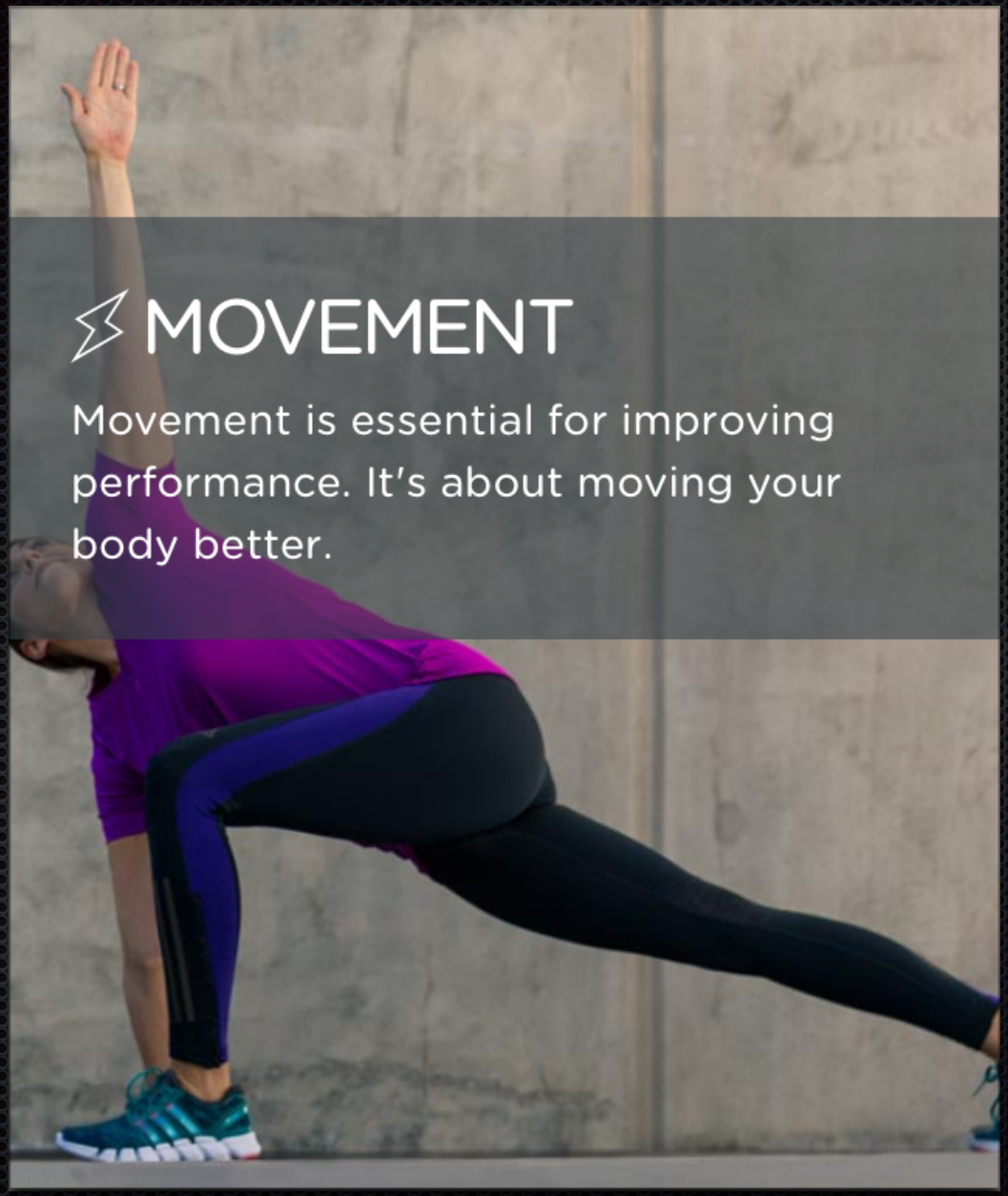

MINDSET
NUTRITION
MOVEMENT
RECOVERY

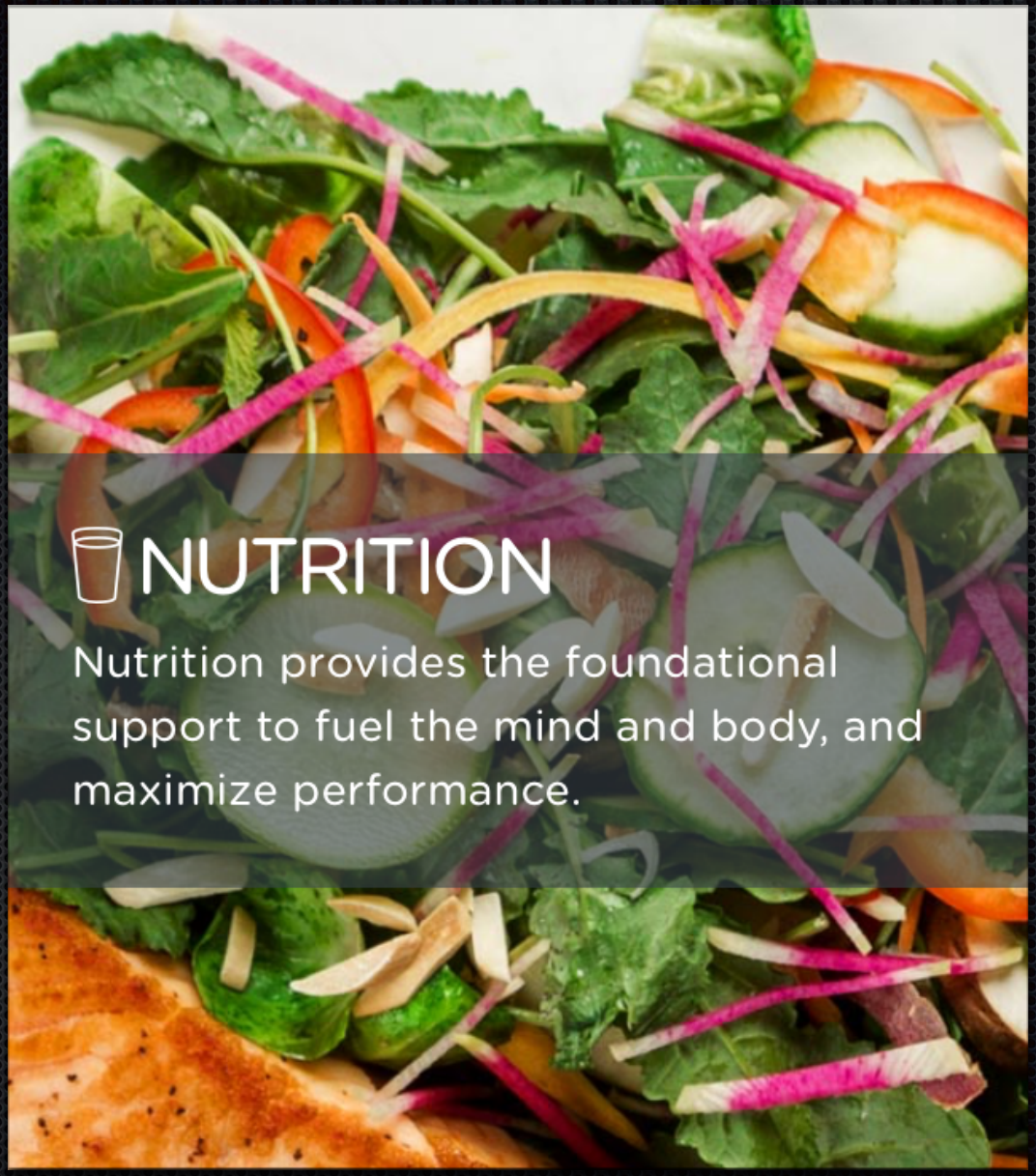
哲学 - 4 つの柱

- 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.

炎症


3 REASONS TO MANAGE INFLAMMATION
1 Chronic inflammation can lead to many illnesses and diseases
2 Excessive inflammation from over exercising, poor diet, or unhealthy habits can negatively impact strength gains
3 Recovery from an injury doesn't begin until inflammation subsides
POWERED BY THORNE RESEARCH
EXOS
PERFORMANCE NUTRITION

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

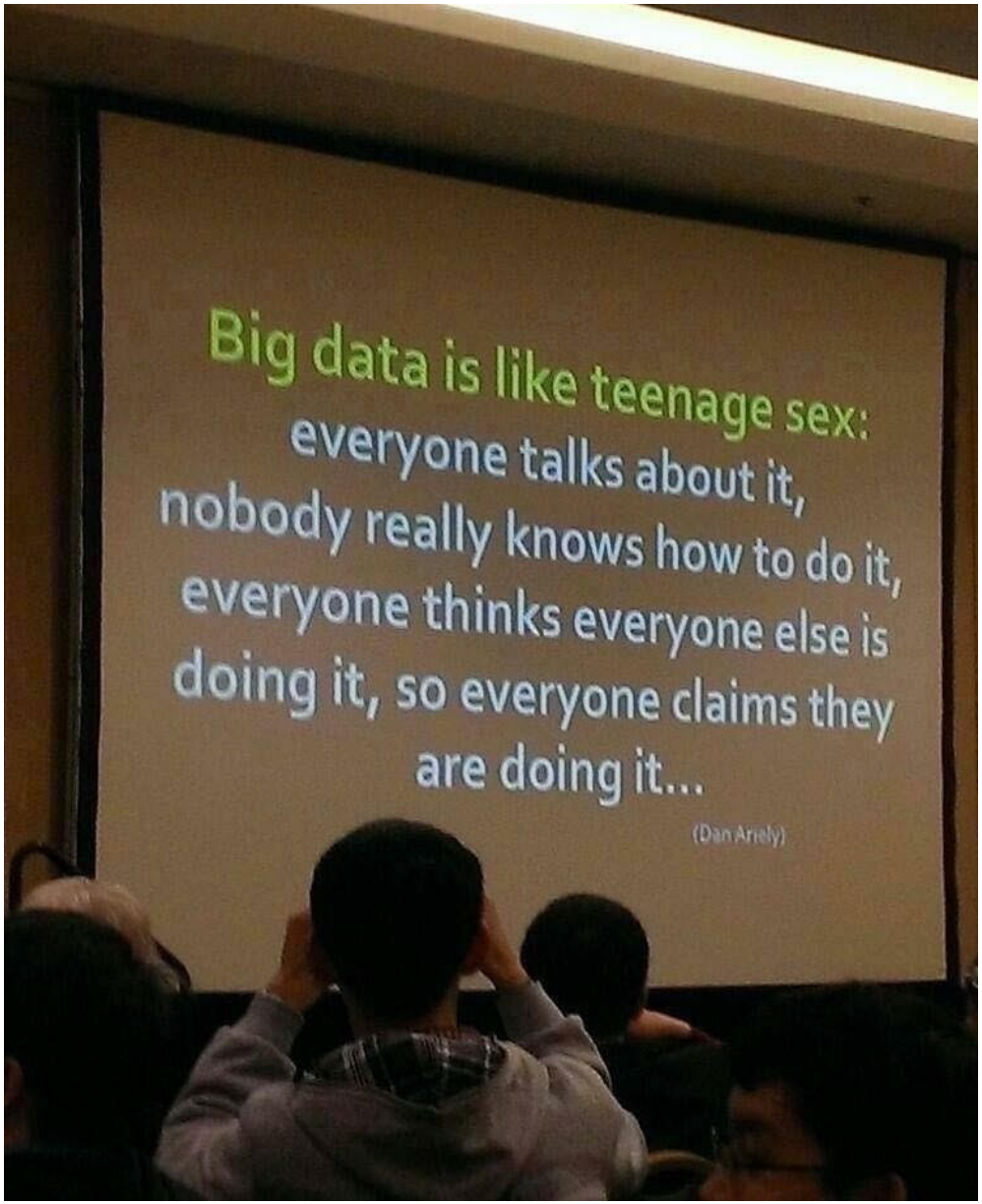
Ephedrine, Strychnine
Sibutramine
Methylhexanamine (DMAA)
Other herbal stimulants
DHEA, Androstenedione
19-norandrostenione/ol
Other prohormones
Tribulus terrestris and other testosterone boosters
Maca root powder
Glycerol, Colostrum


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

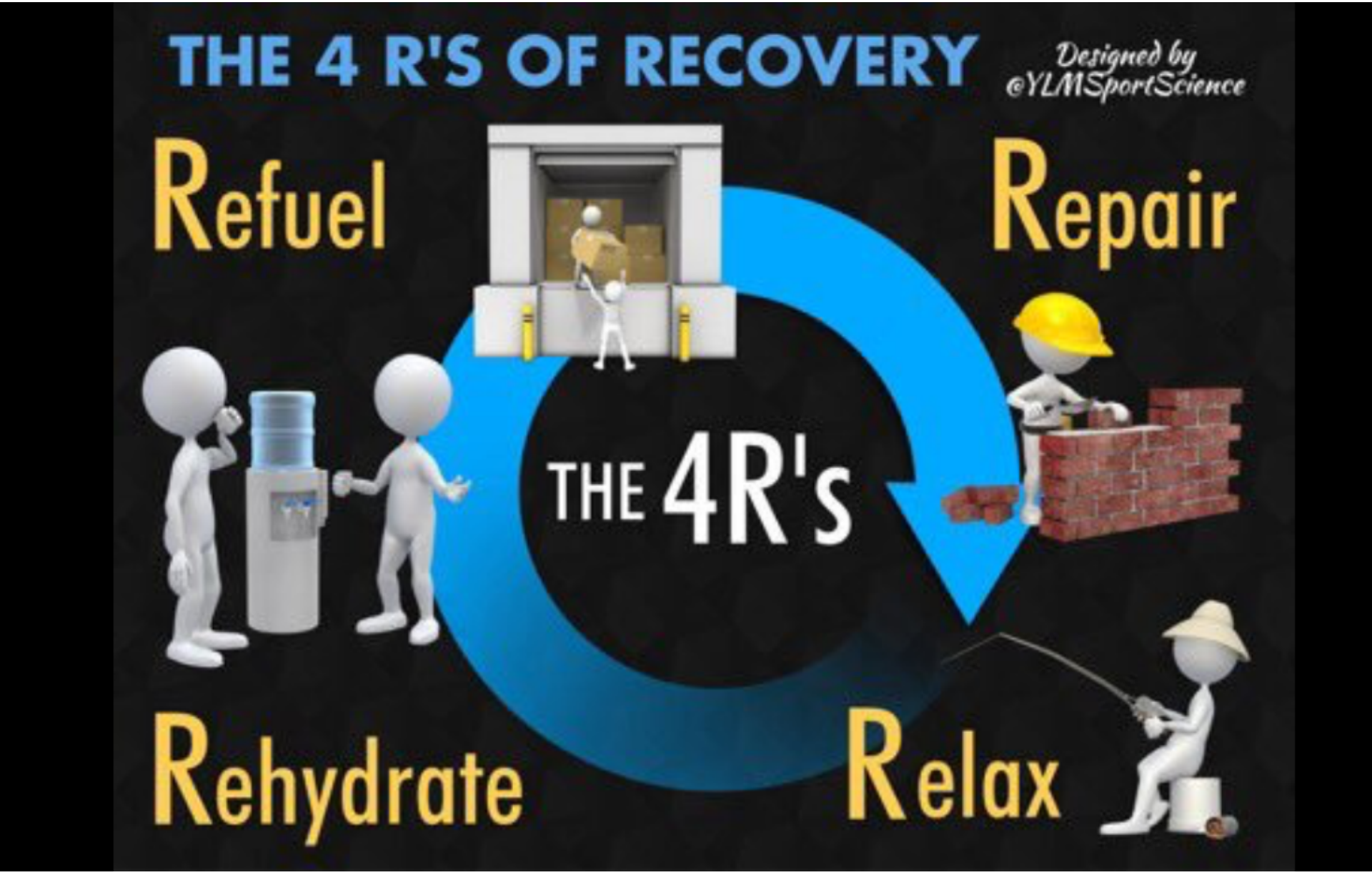

The Injury Prevention Pyramid
The Sports Physio @adammeakins
Other
Bull Shit
Quackary
Tapes/braces
Stretching
Movement Skill
Strength Training
Load Management


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)

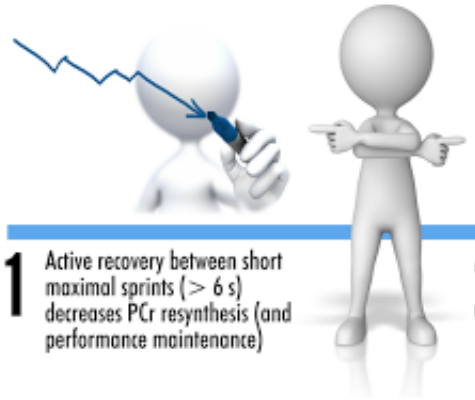
To avoid early morning schedule

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

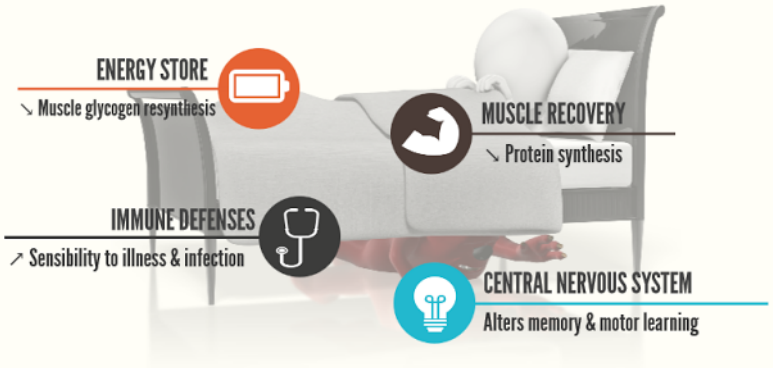
4 During short interval training, passive and active modalities lead to similar accumulated time near VO2max

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）アクティブリカバリー

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

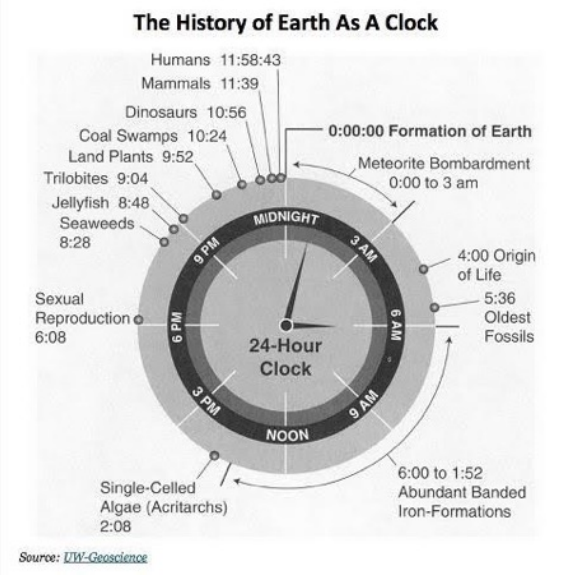
Forest dwellers and nomads suffer fewer musculoskeletal lesions than "civilised" people

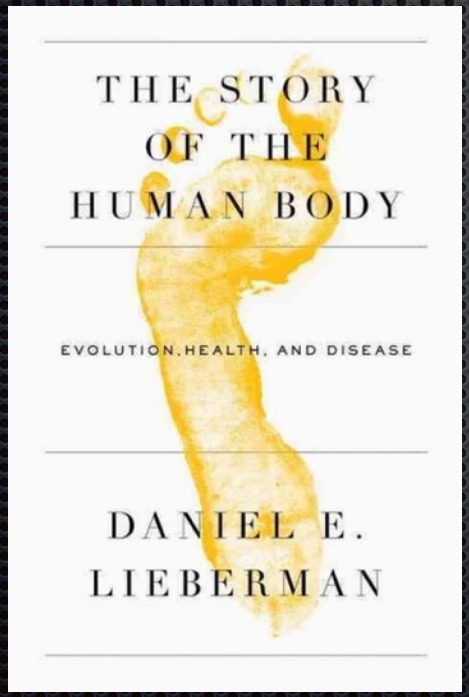
Nature's automatic manipulator during sleep is the kickback against the vertebrae by the ribs when the chest is prevented from movement by the forest floor

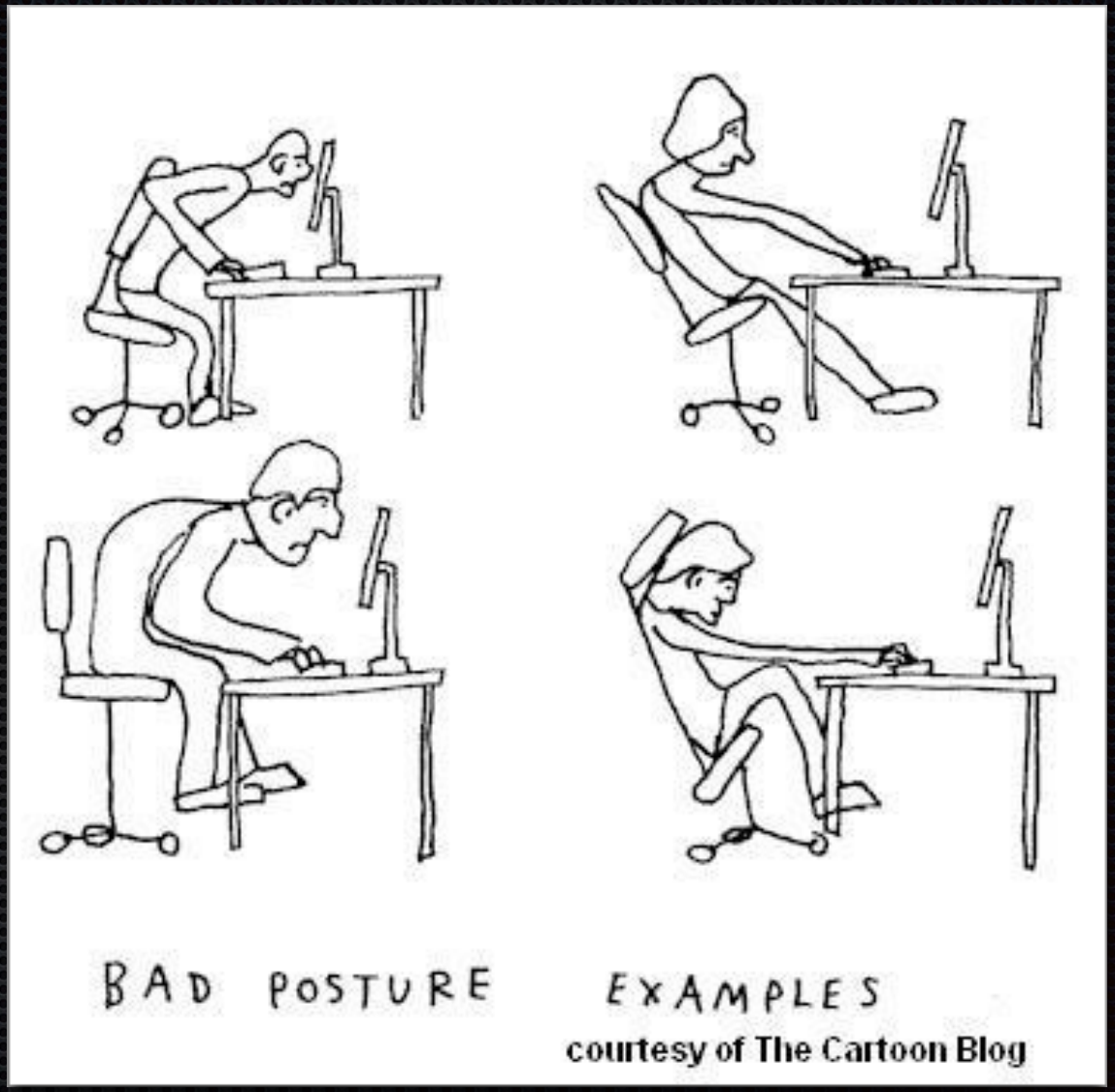
Various resting postures correct different joints

Pillows are not necessary

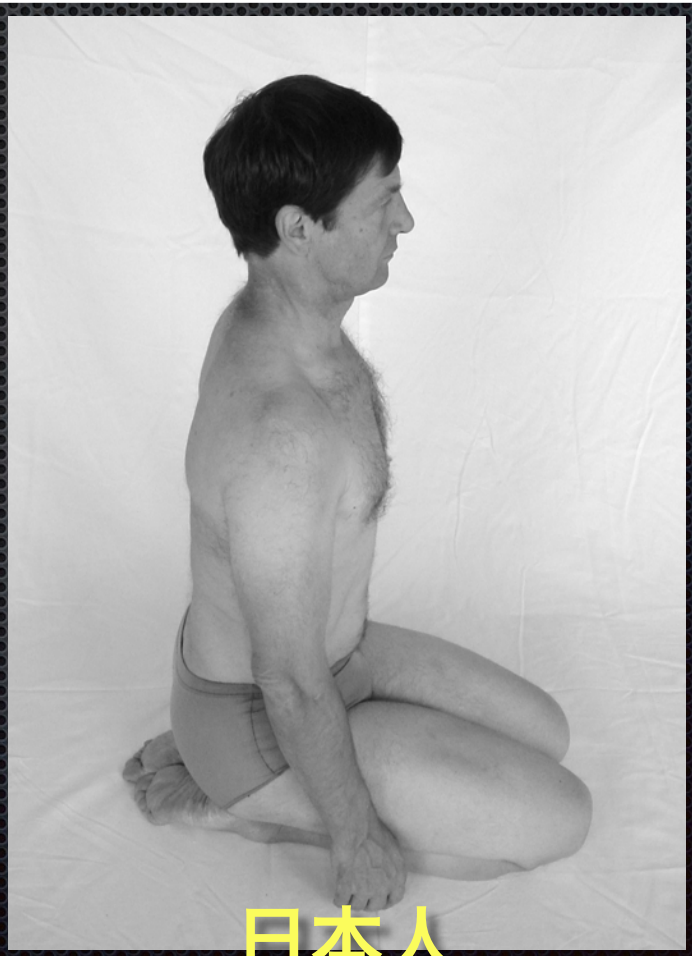
Fig 5 Quadrupedal lying


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

プライマルレストポーズ



つま先を曲げて前方へ

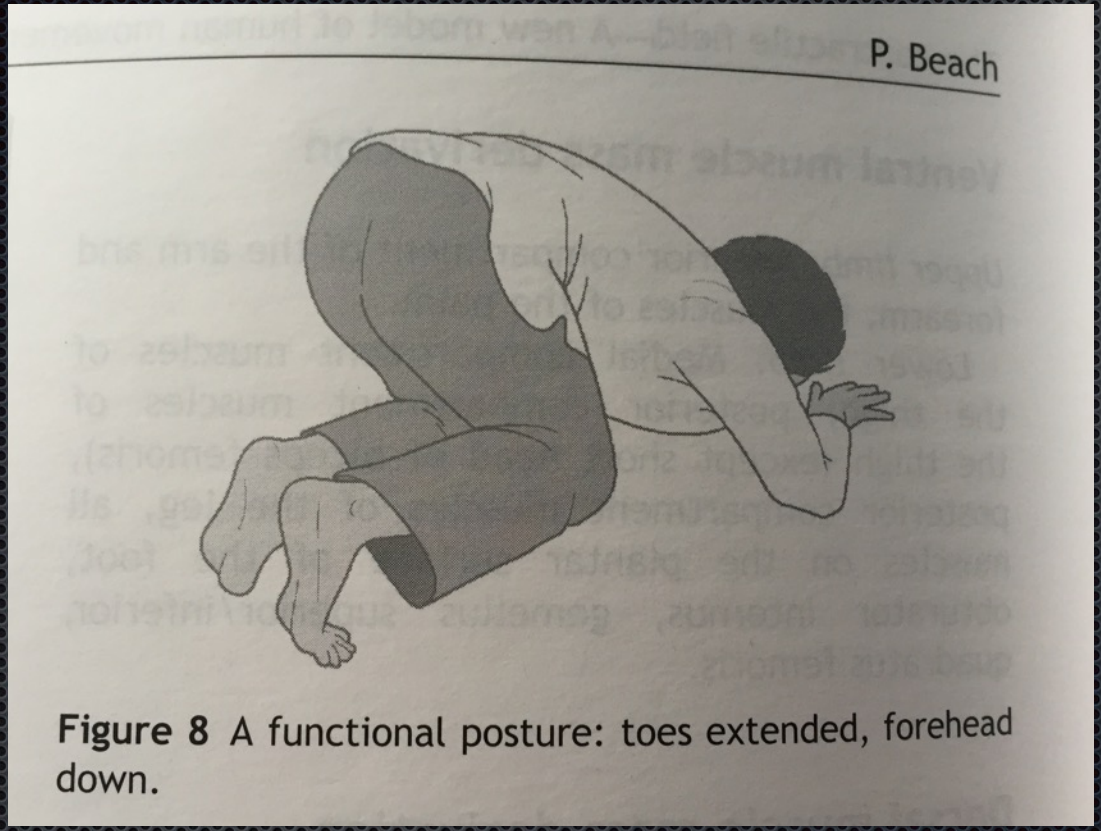
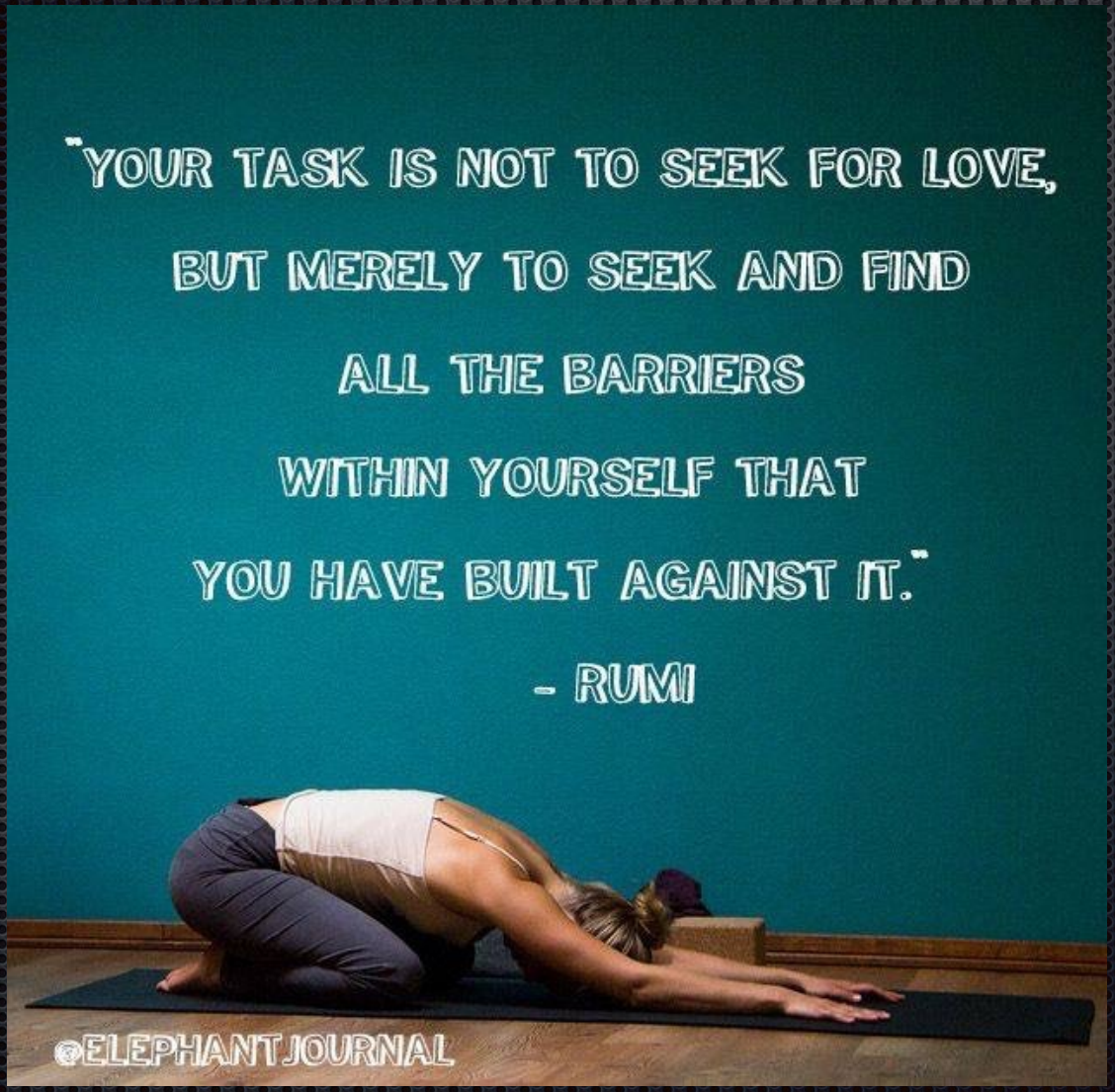


Figure 8 A functional posture: toes extended, forehead down.

ドリンキングポーズ／祈り

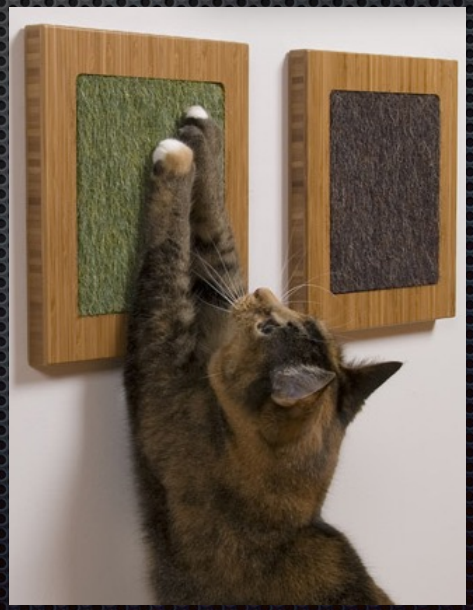


フルスクワット

フルスクワット

Fig 7 The full squat

C) モビリゼーション



ロードシェアリング

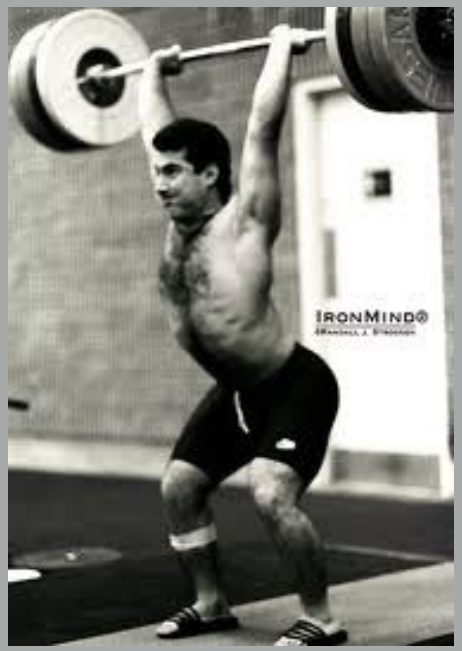
テスト

- スクワット
- ランジ

すべてのエクササイズはテストである

モビリティーの問題か？

スタビリティーの問題か？



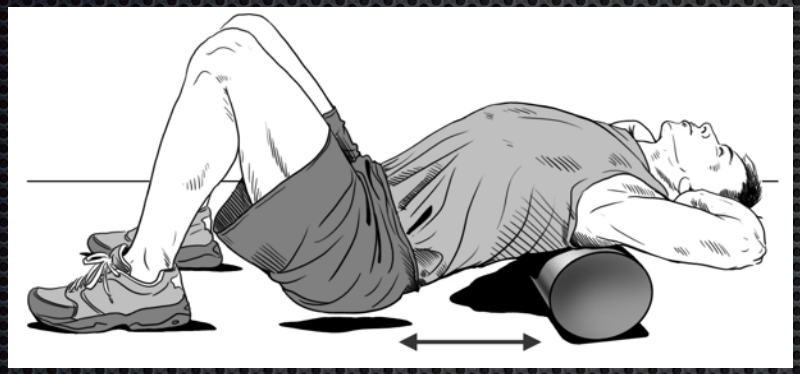
DONT TRANSLATE THIS PAGE!

- 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*

DONT TRANSLATE THIS PAGE!

- 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)*

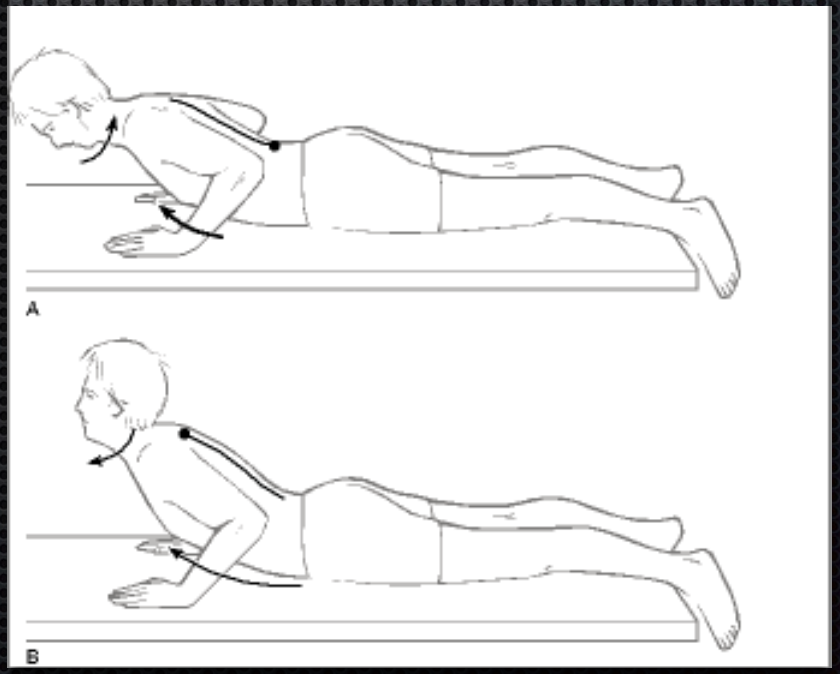
1.胸椎モビリゼーション



Jiri Cumpelikの腹臥位 T4 モビリゼーション

A -正しい

B - LCS & C0-C1 の過伸展
正しくない



垂直フォームロール

- 仰向けでスタート
- 手の平を上に向けて身体の横に
- 腹式呼吸

垂直フォームロール

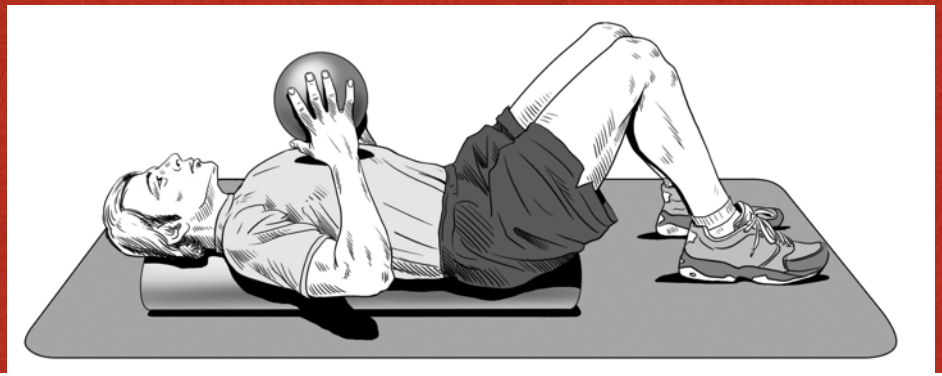
- 腕を頭上に持ち上げる
- 手の甲を床につける
- できなければ腕を下す
- 1-2 呼吸ホールド

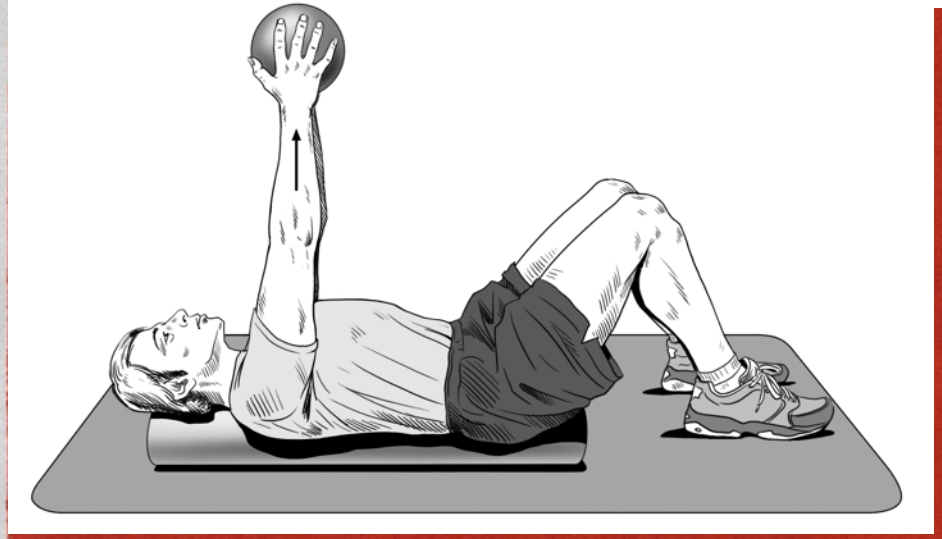
チェストプレス

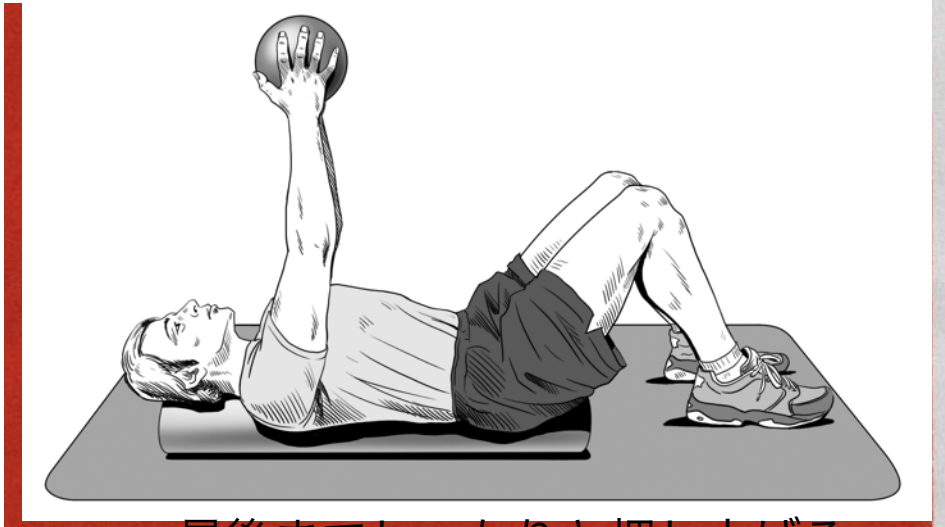
- 両手でメディシンボールを持つ

- ボールを天井に向かって押し上げる

- 8-10回繰り返す







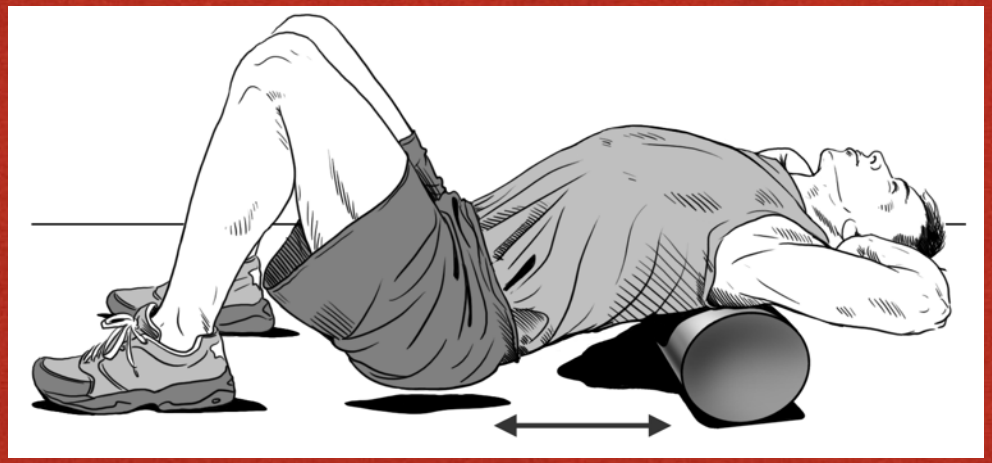
最後までしっかりと押し上げる

水平フォームロール

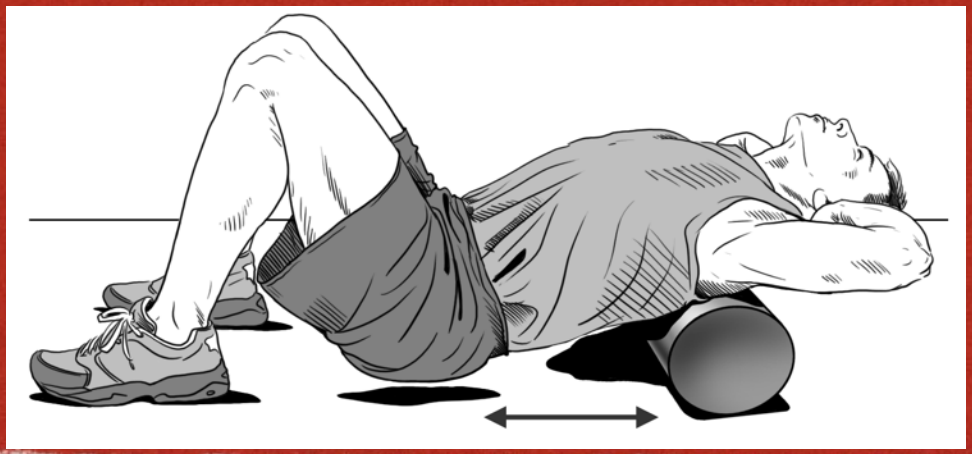
- フォームローラーの上で背中を伸展

- 顎を引く

- 30秒程度までストレッチ＆ロール

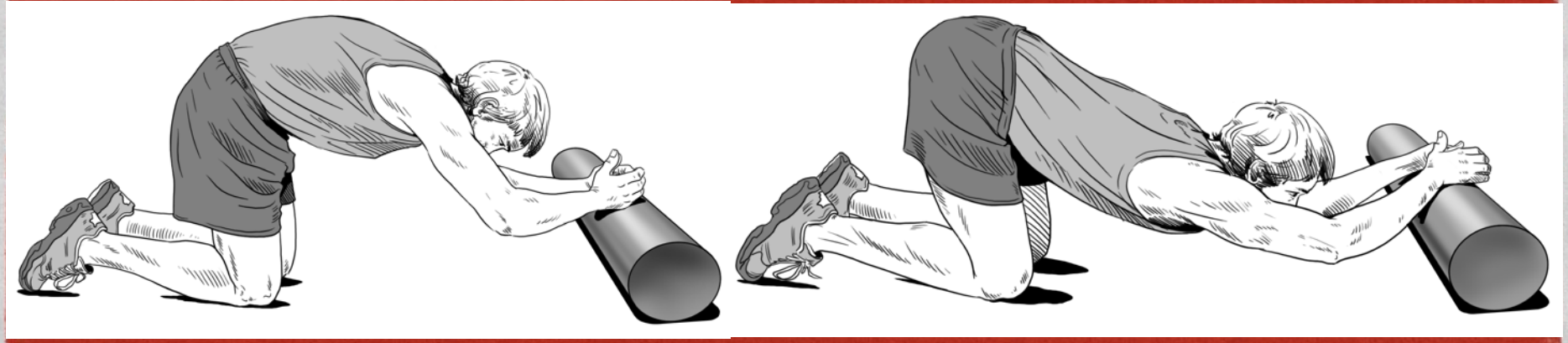


顎を
突き出さない



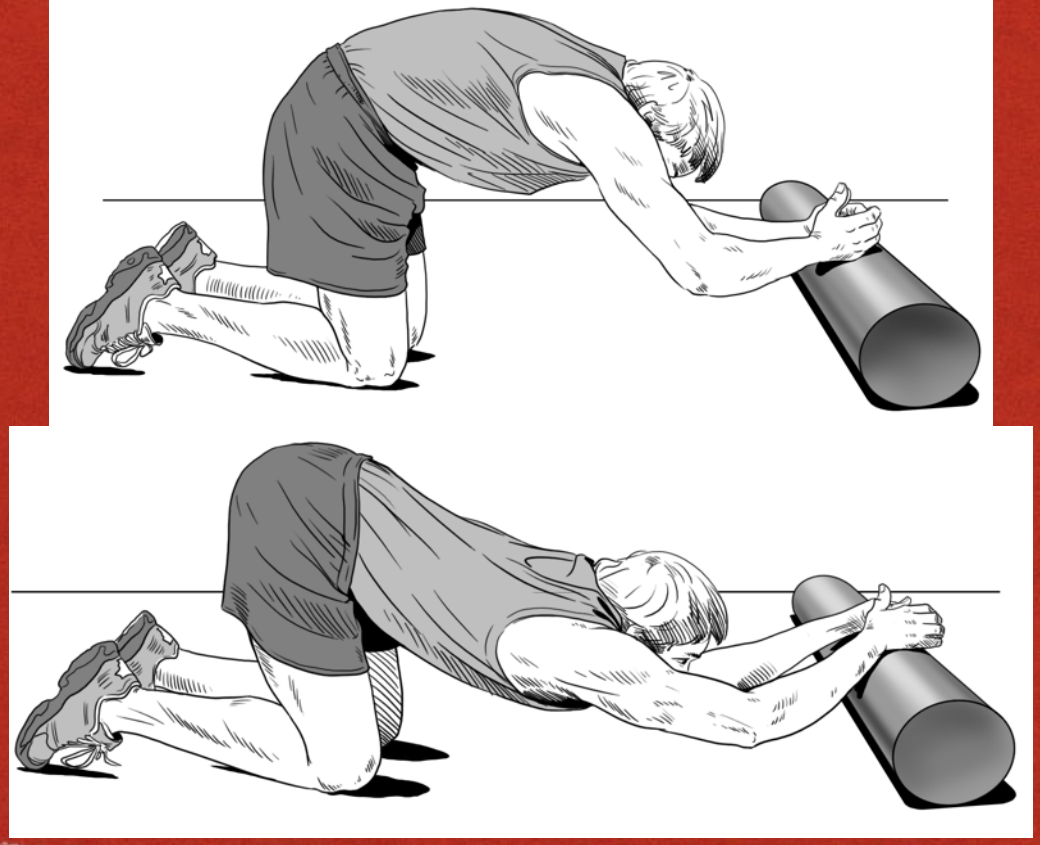
上背部キャット

- 手首をフォームローラーの上に置く
- 背中を丸める
- 胸をおろす
- 8-10 回繰り返す



避けるべき間違い

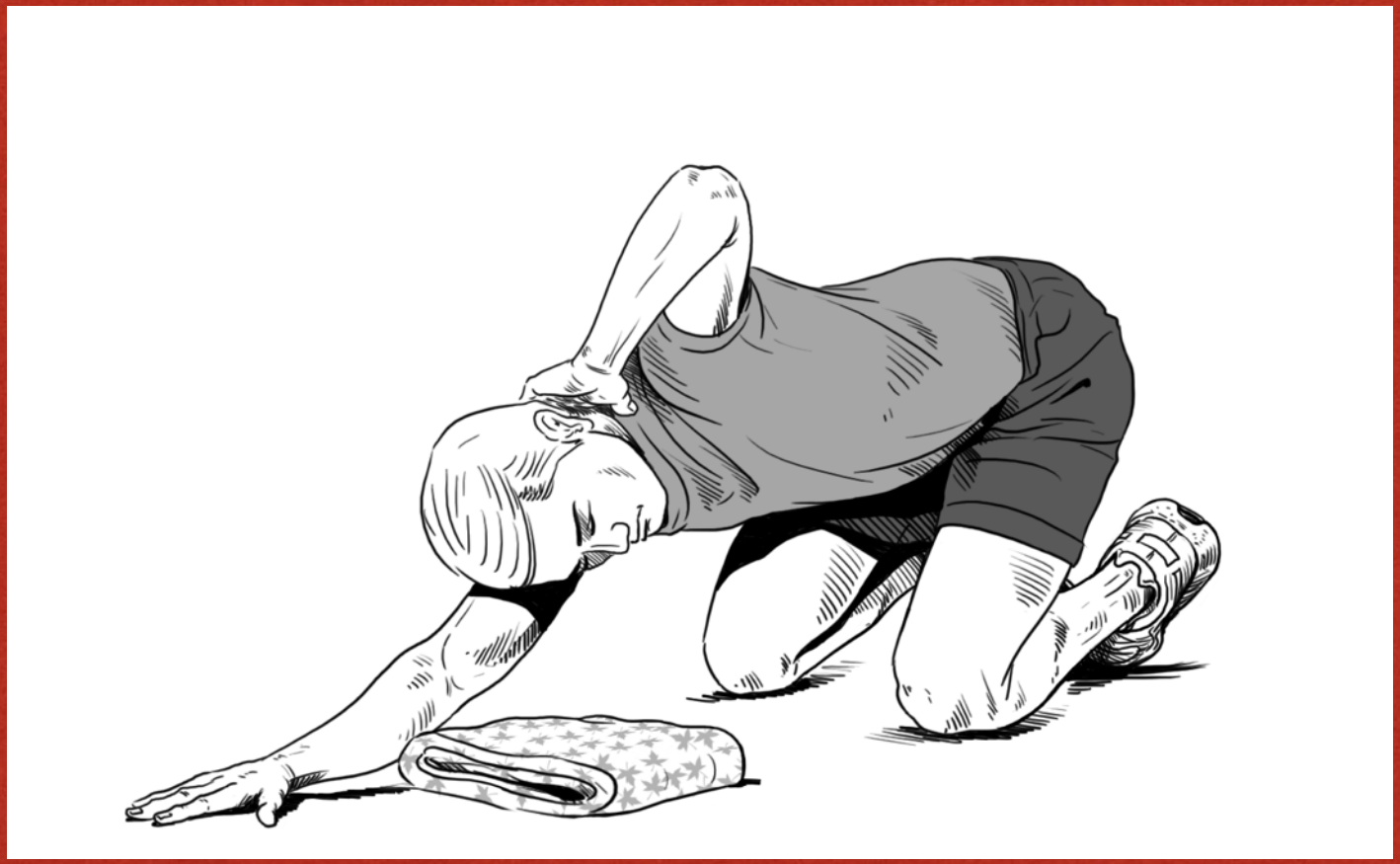
- 肩をすくめる



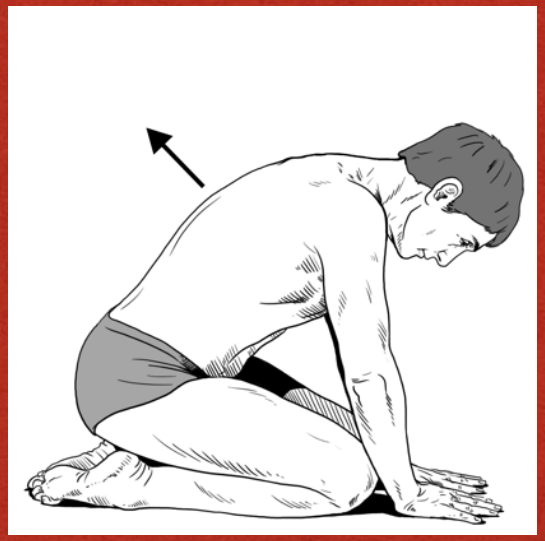
中背部回旋

スタートポジション

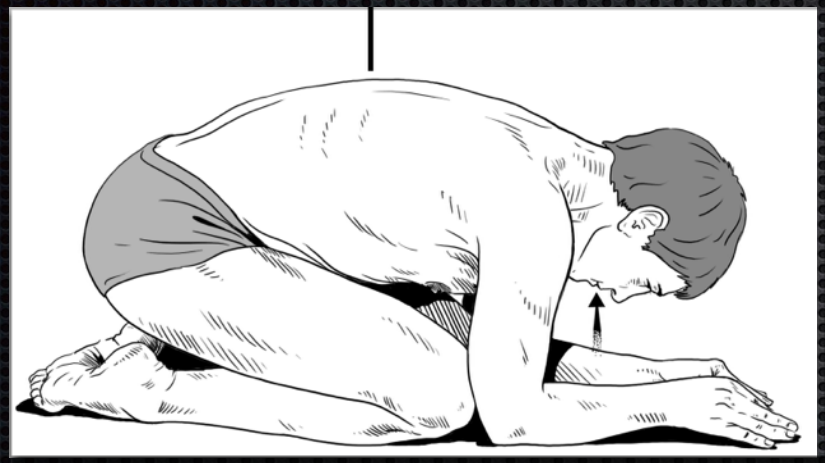
終了ポジション

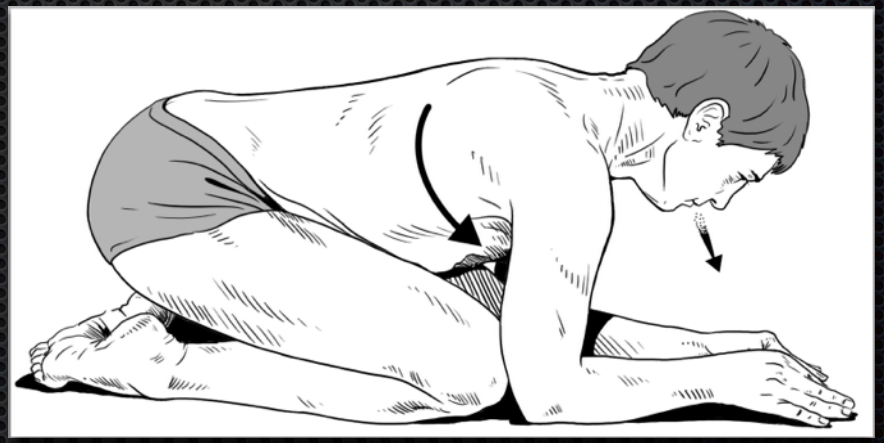


スフィンクス – T4-8



Jiri Cumpelik, PT

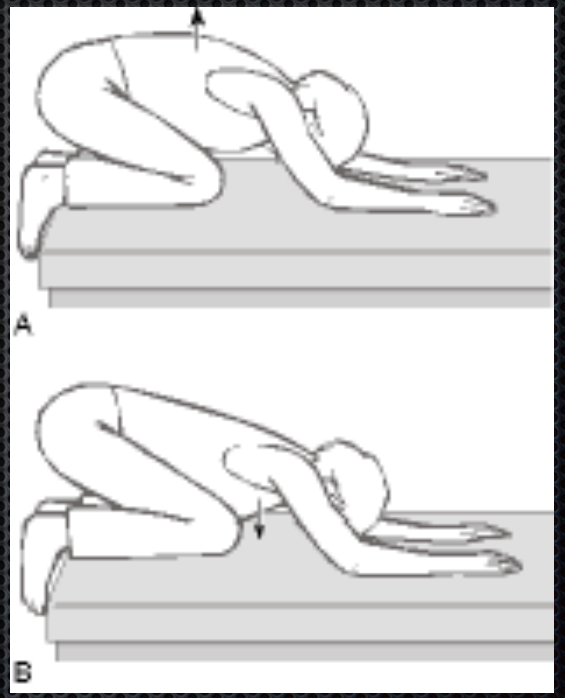




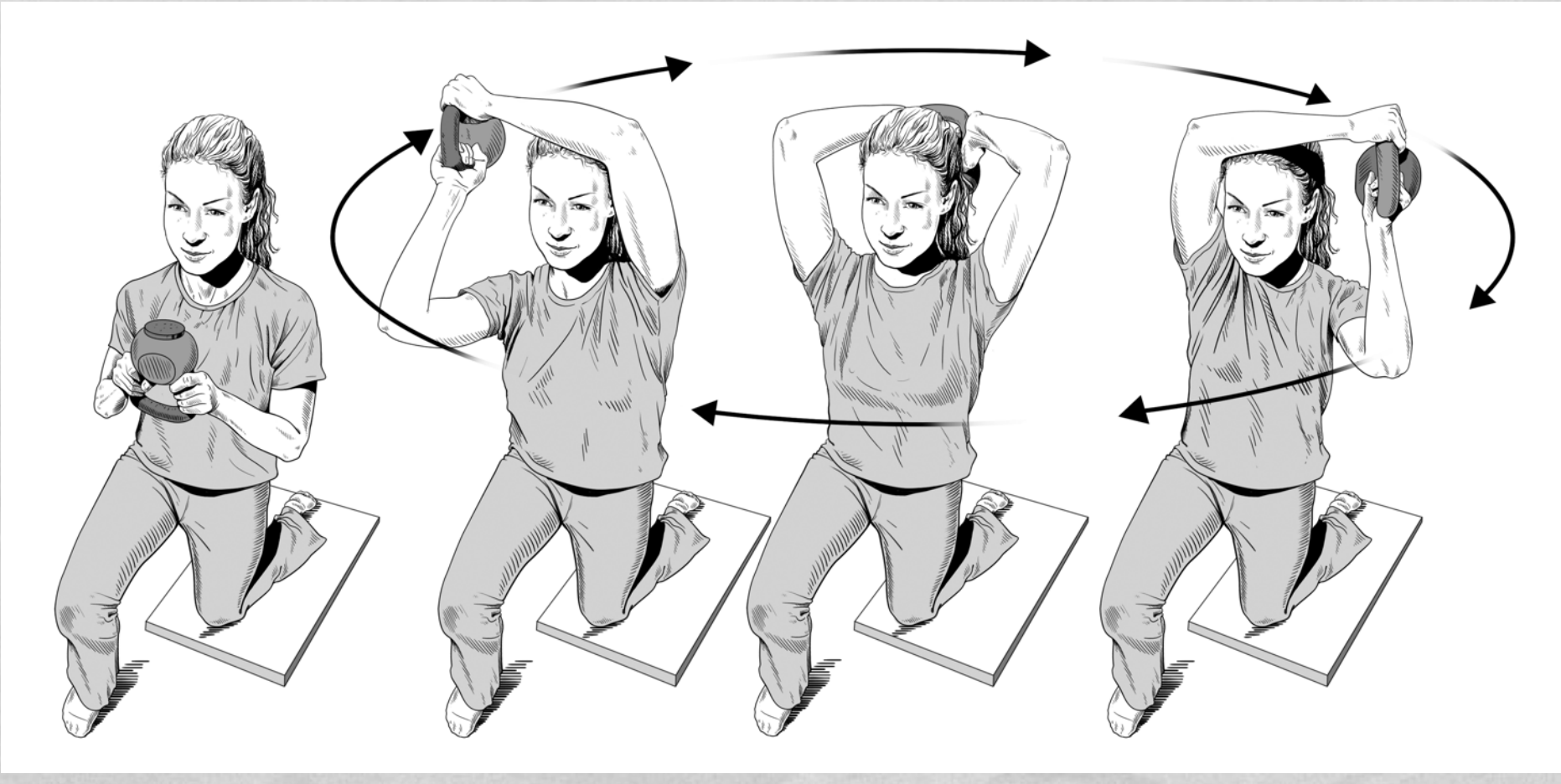
T4 スフィンクスプログレッション

コラー T4 伸展　祈り

- 膝を外転し内顆に圧がかかる
- T4-8 を伸展するために撓める
- アクティブに胸骨を床に向かっておろす



THE HALO



クレッシィ 上部胸椎モビリゼーション

Upper Body Book

DeFranca C, Liebenson C

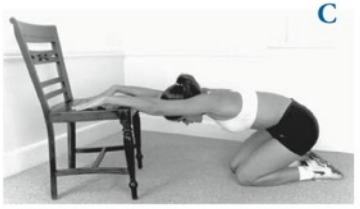
Exercise: Latissimus Dorsi Stretch

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)



レウィットの T4 ウォール リーン

レウィットのPIRモビリゼーション

ure 19.68 Upper rib PIR mobilization.

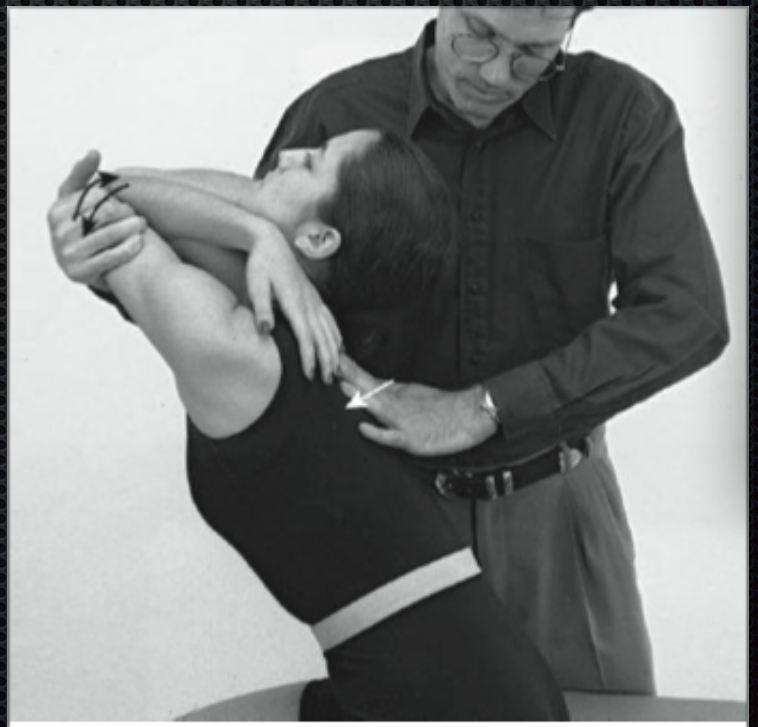
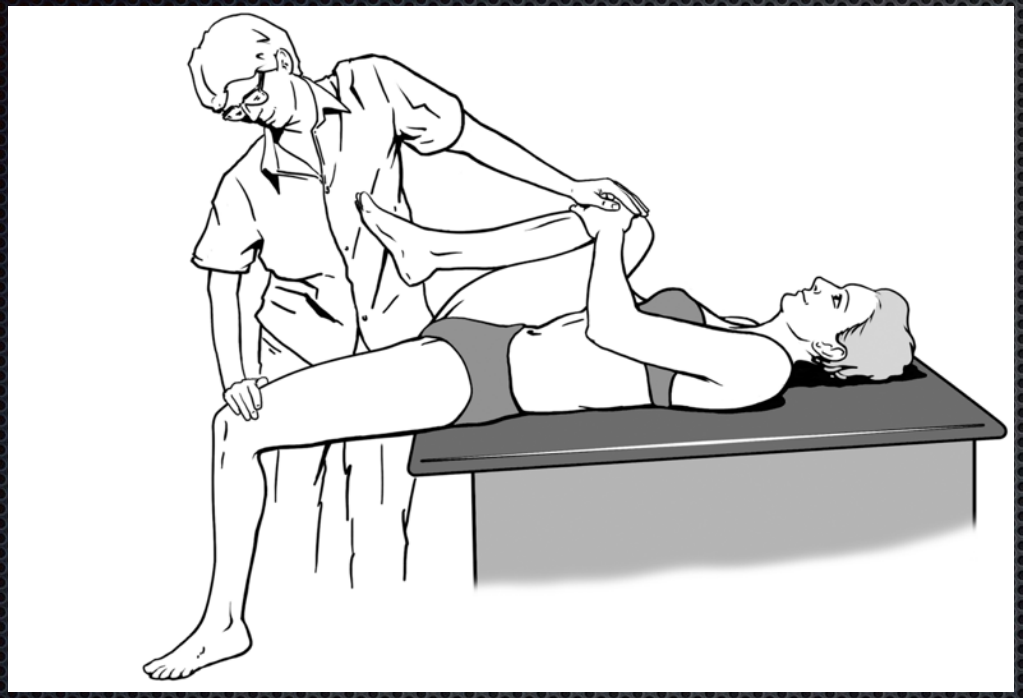


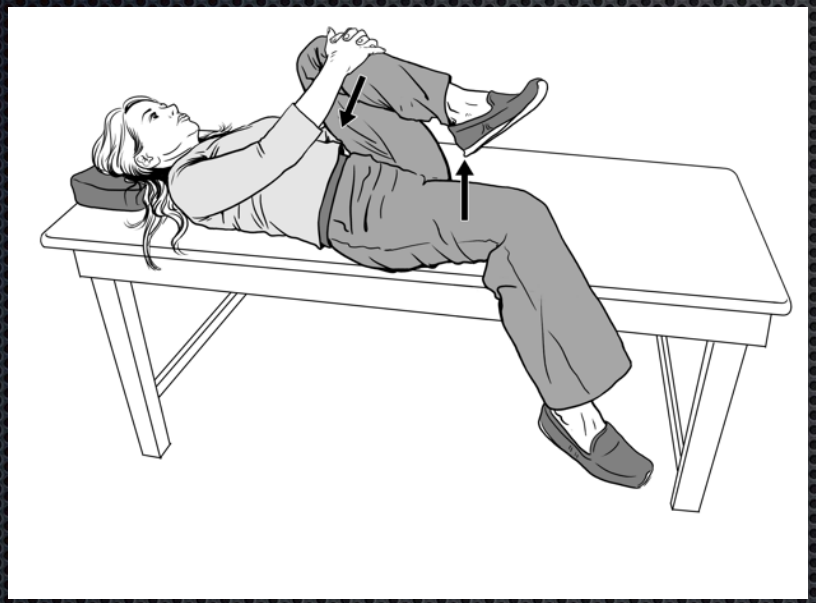
Figure 19.61 Thoracic spine extension PIR mobilization.

2.股関節モビリゼーション

a) 腰筋ストレッチ／関節包前部

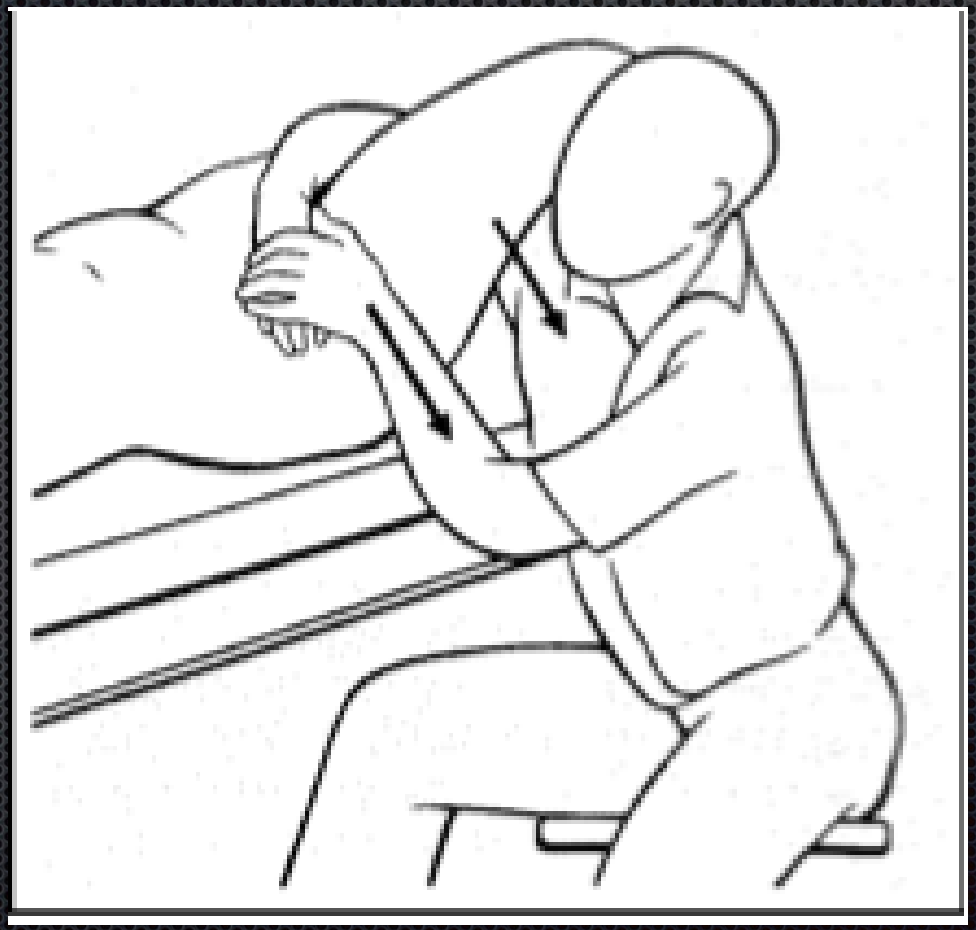


上前部関節包モビリゼーション

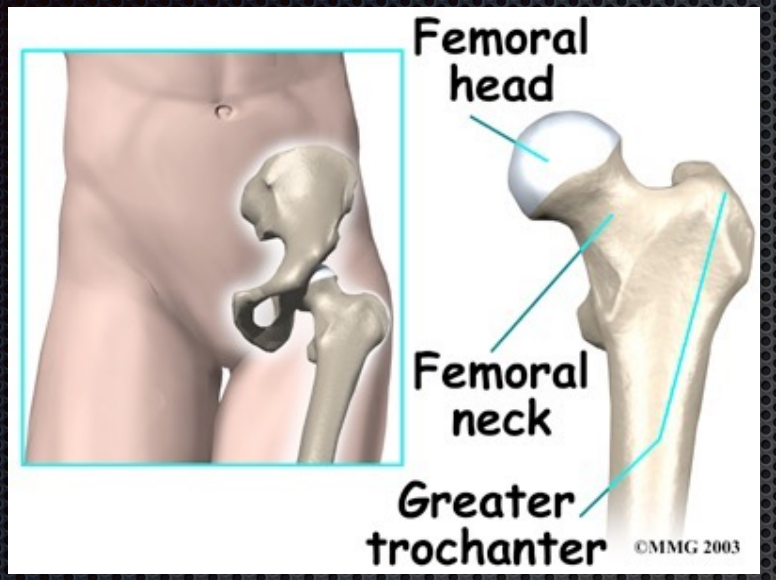


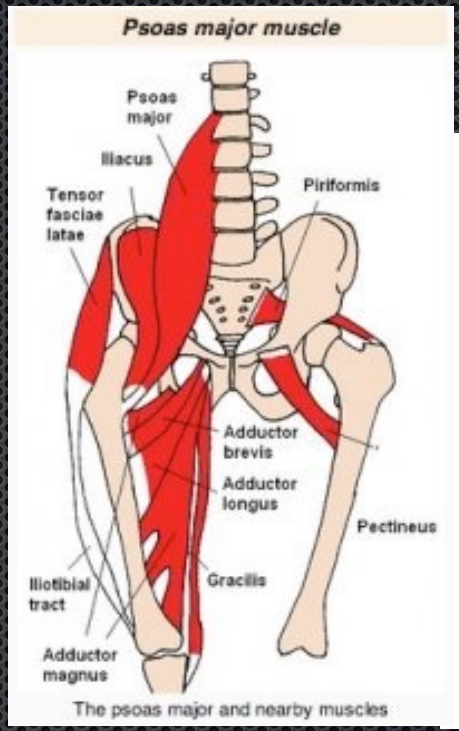
スライダーを使って

レウィットの股関節前部モビリゼーション

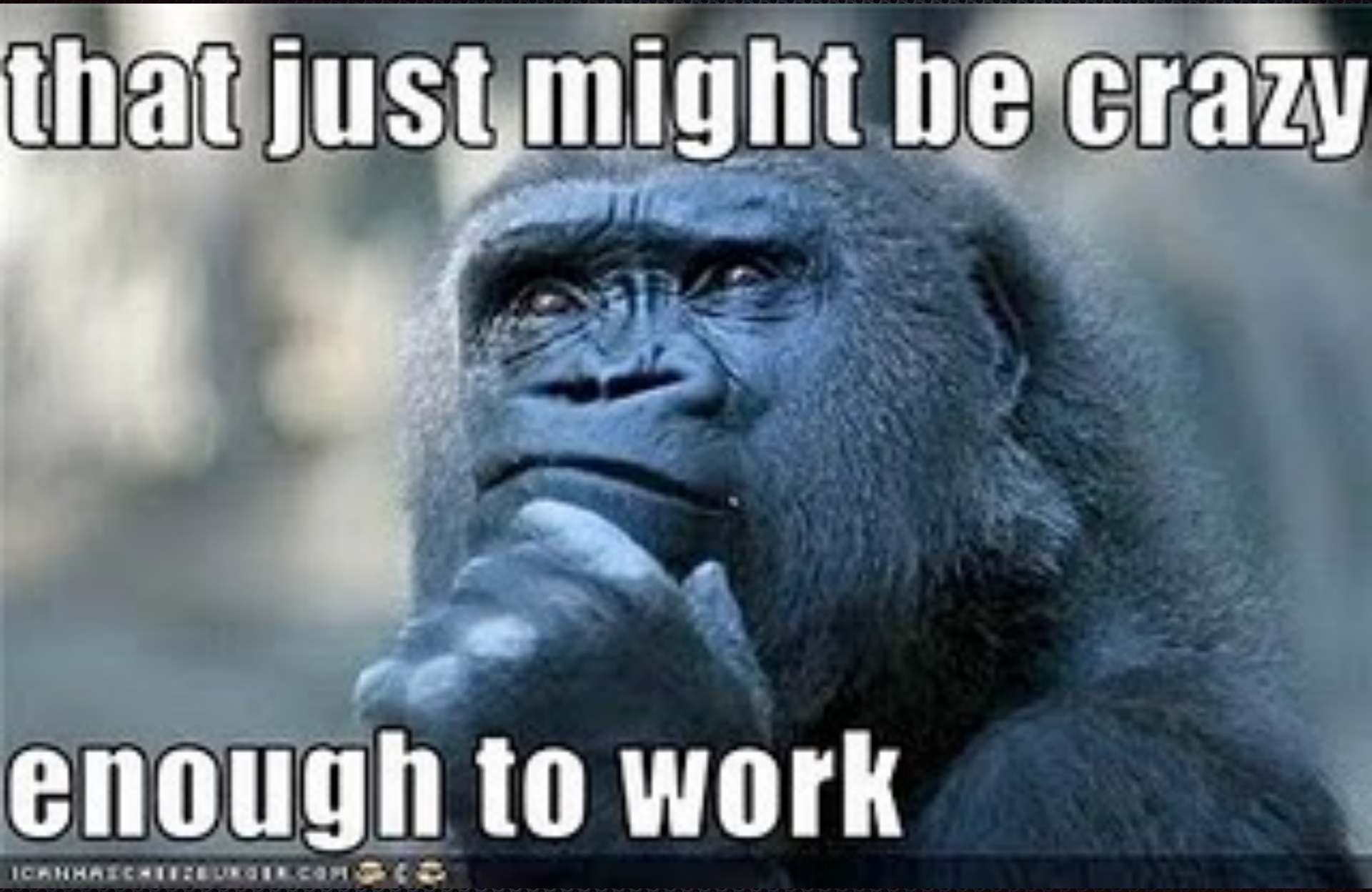


解剖学


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

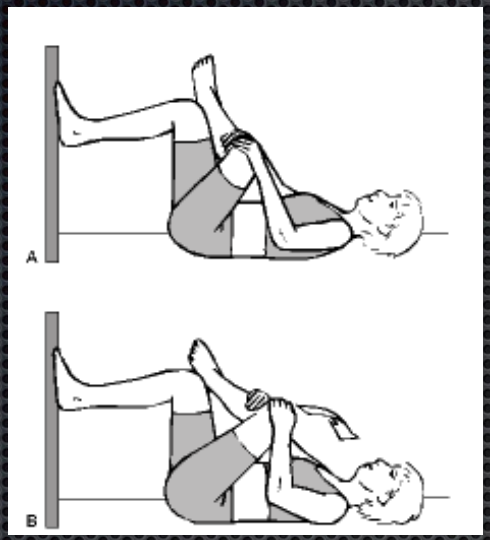

3D SCIENCE.COM

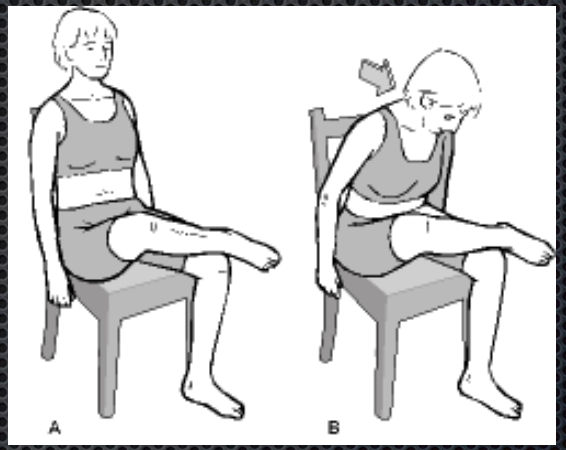

that just might be crazy
enough to work
ICANHASCHEEZBURGER.COM

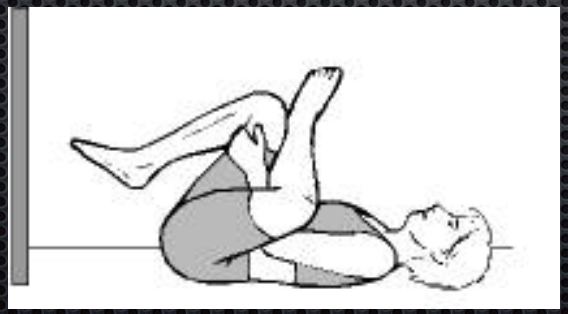
b. 梨状筋ストレッチ／股関節包後部モビリゼーション

ISCRS
INTERNATIONAL SOCIETY OF CLINICAL REHABILITATION SPECIALISTS

リカンベントまたは座位での 梨状筋または股関節包後部ストレッチ







シットバック

3.足首モビリゼーション

- レッグスイング

- 片脚で立つ

- 目の前にある物につかまってバランスをとる

- 持ち上げた脚の膝を曲げる

- 持ち上げた脚を左右にスイング

- 足裏を床につける

- 脚をスイングする際に足首が動くのを感じる

3.つま先モビリゼーション＆プリミティブレストポーズ

D)脊柱温存戦略

座ることはなぜ手に負えないのか？

よくない姿勢

注意

- 患者はADLや腰に関して一貫したアドバイスを得ているのか？一貫性のないアドバイスを得ているのか？

ISCRS
INTERNATIONAL SOCIETY OF CLINICAL REHABILITATION SPECIALISTS

注意

- 長時間の座位

- 早朝の屈曲

注意

- 屈曲可動域最終域でのリフティング

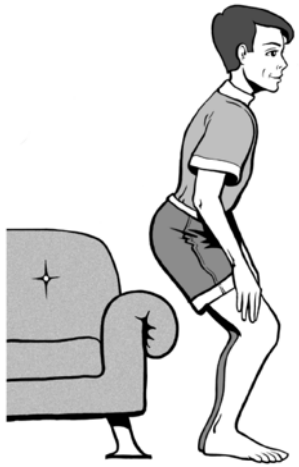
- 屈曲可動域最終域での負荷のかかったエクササイズ

注意

**“最初の治療は患者に損傷を与えること
をやめさせること”**

Karel Lewit

- 例:

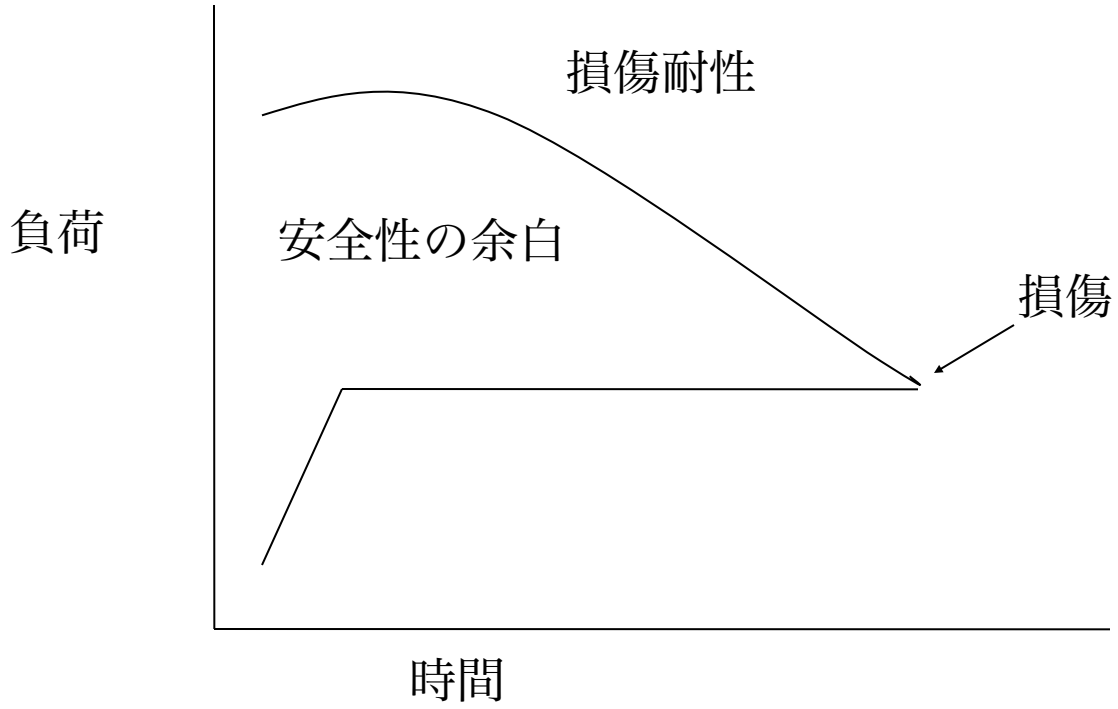


なぜ腰が痛いのか - 毎朝シットアップを100回行っているのだが？

屈曲が最も危険なのはいつか？

- Stover Snook 1998

長期にわたる可動最終域における ローディング



Derived from:
McGill S, Lower Back Disorders: Evidence-Based Prevention and Rehabilitation.
2002, Human Kinetics, Champlain, IL

1. スクワット – p645

- 患者に脊柱温存を指導する
- ベットや椅子などから起き上がるのに脚を使う
- 脊柱の直立した姿勢を維持する（ニュートラルな前弯）

機能において

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]

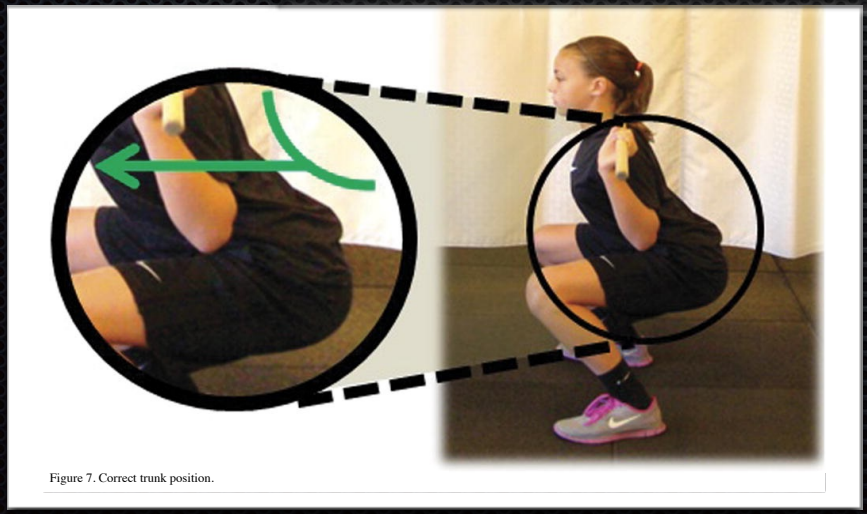


Figure 7. Correct trunk position.

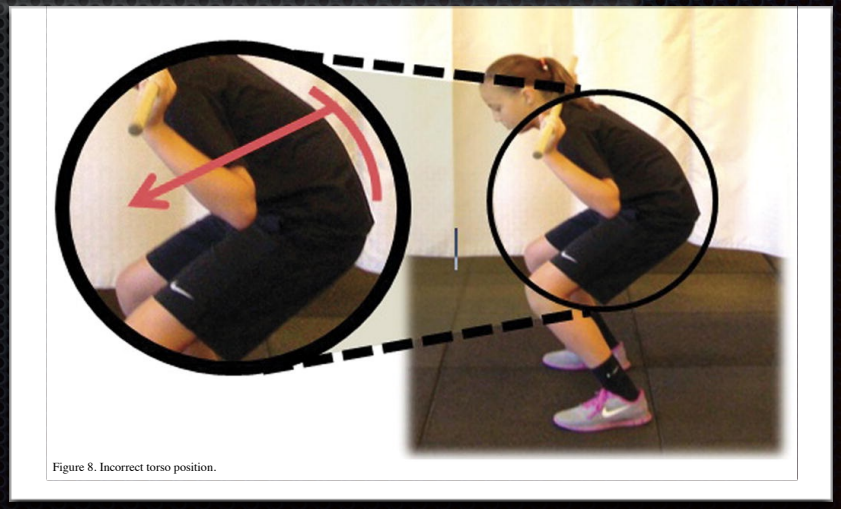


Figure 8. Incorrect torso position.

発達学的運動学

スクワットトレーニング

2. バットウィンク

Aaron Lipsey w// Pr McGill

スクワットのための最適な股関節と足の幅を選択するp 156 Pr McGill (4th ed)

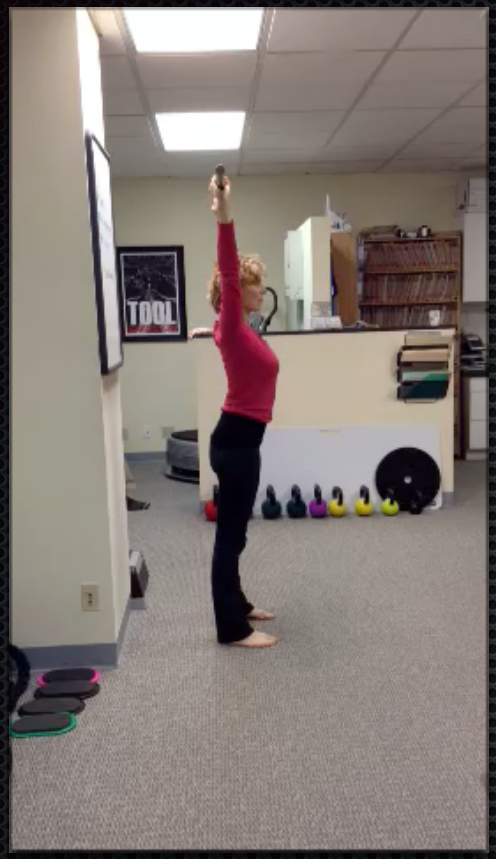
- 寛骨臼の深さが、その個人のスクワットの深さを決定づける
- バット”ウインク”をチェックする
- 最初に屈曲が起こる場所の角度をマークする
- 理想的なスクワットのための足の場所を見るために膝を様々な幅にする

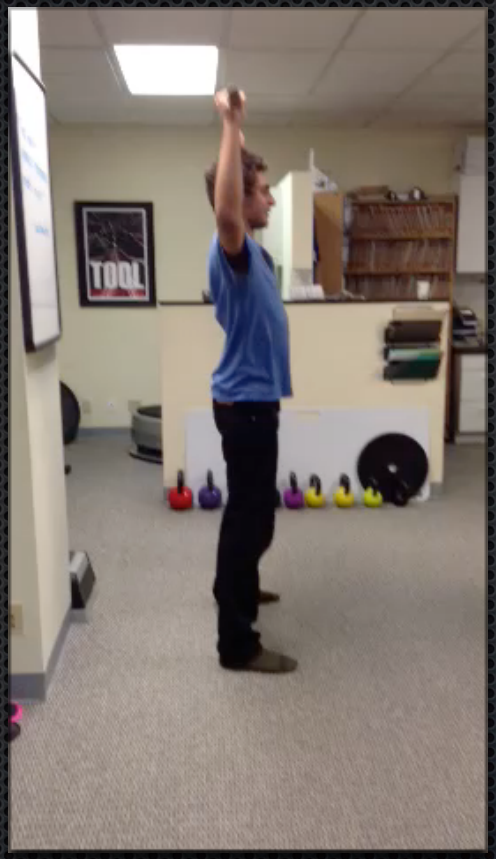
Tony Gentilcore

ニュートラル vsタックド

クアッドロック

スクワット評価





ヒップヒンジ

p304. 645

棒

肘掛／ボックス


Rx'd 30:12

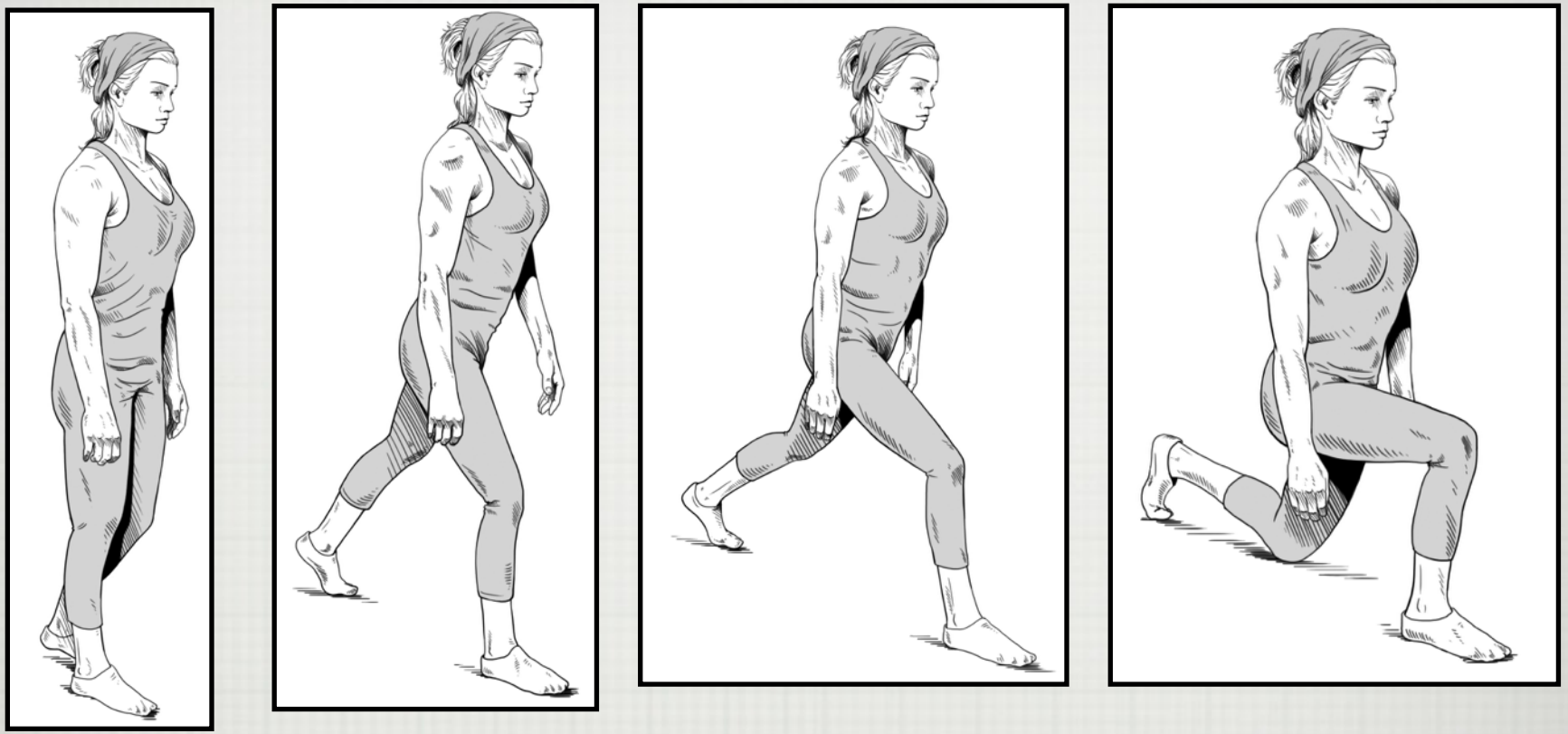
ウェイターのお辞儀

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

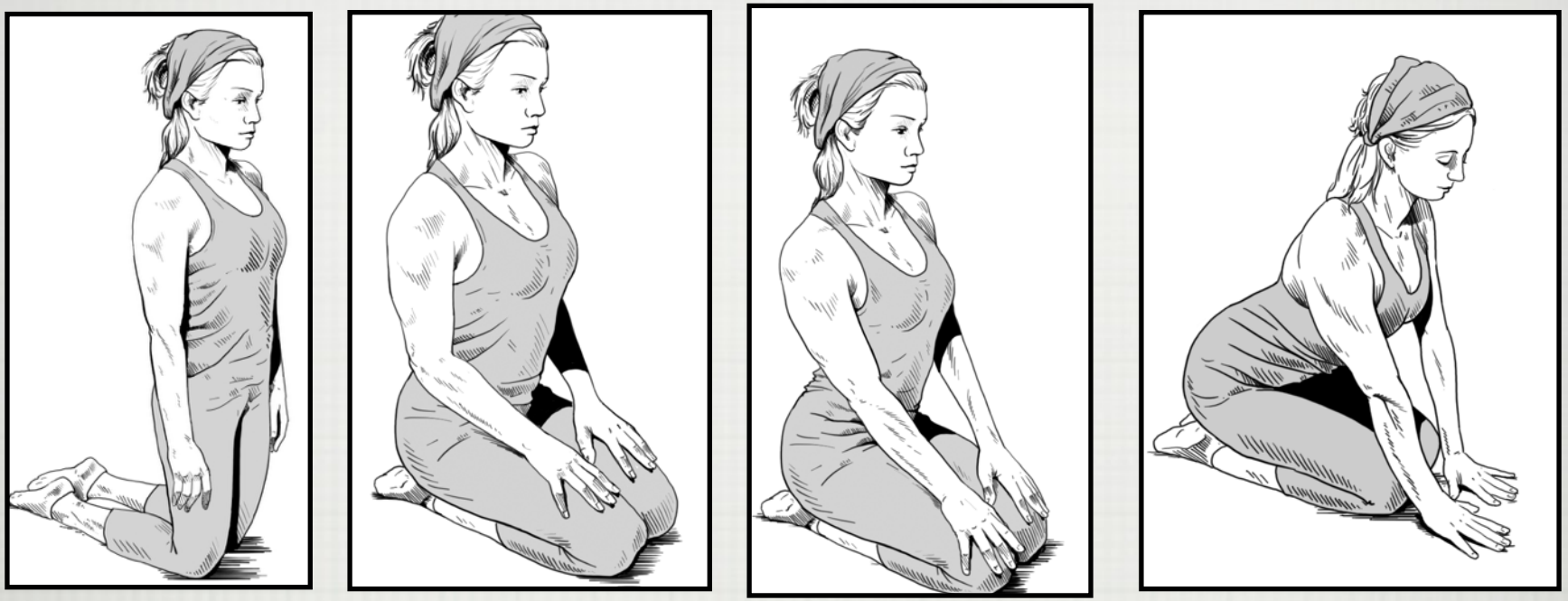
b) ショートストップ

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.



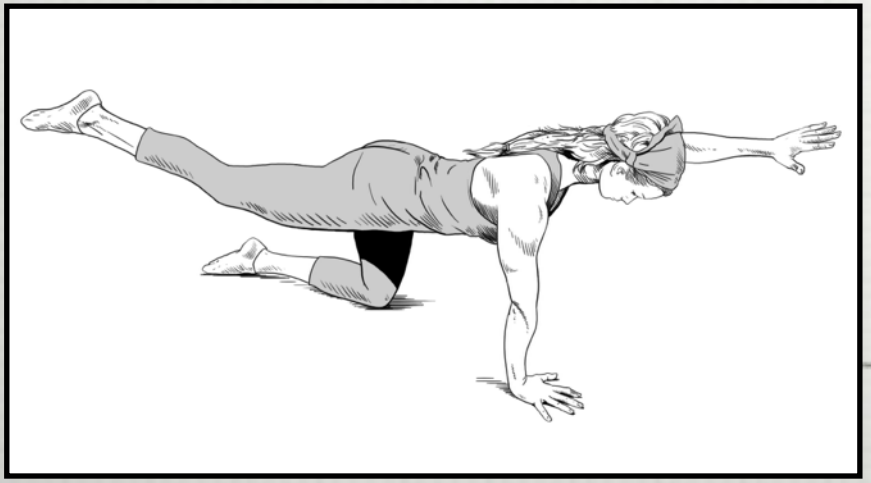
c) リバースランジからニーリング

トールニーリングヒップヒンジ

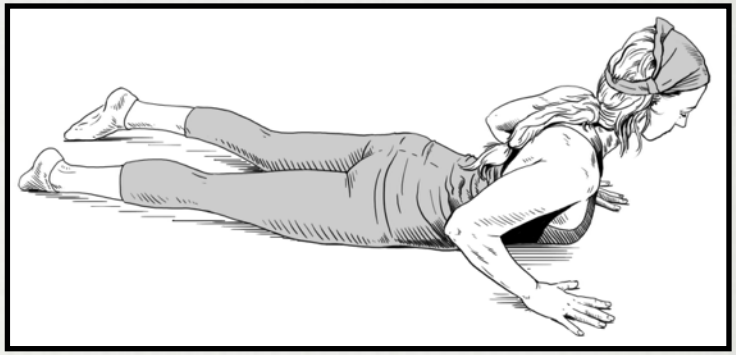


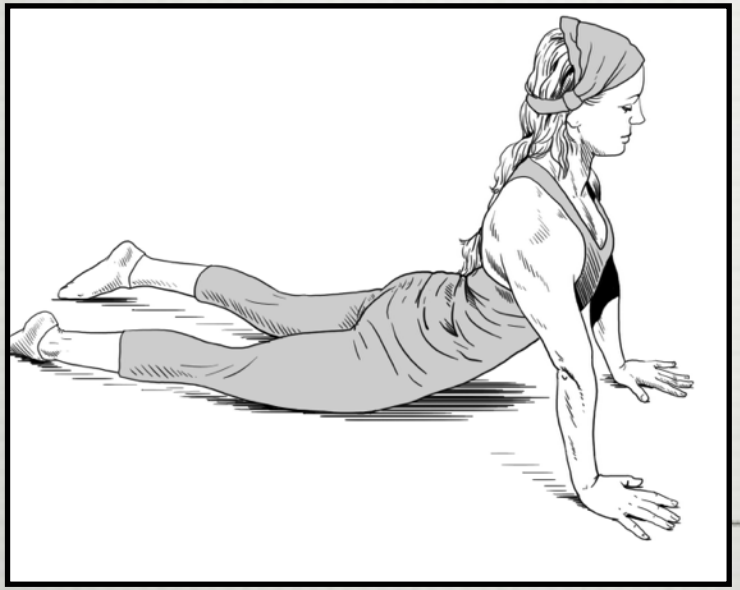
e) トールニーリングからスフィンクス

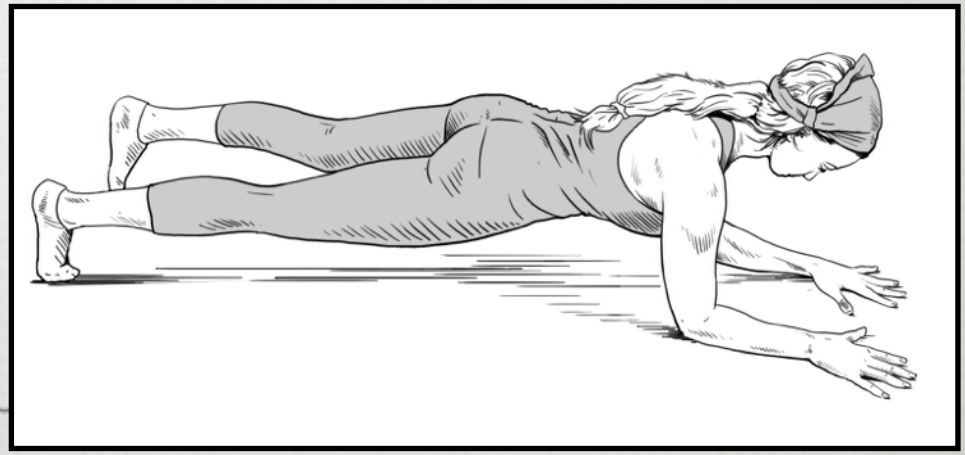
f) ニーリング～四つ這い～バードドッグ



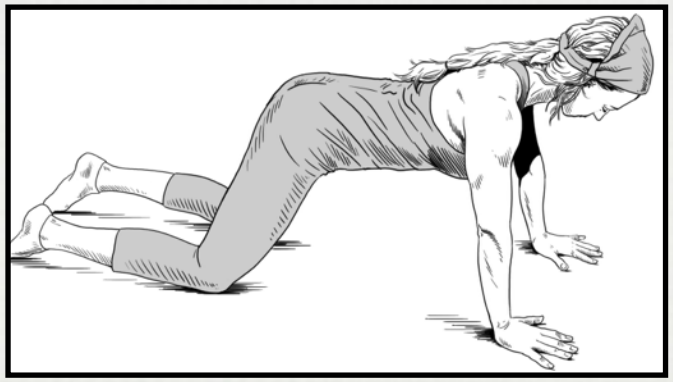
g) スフィンクス～コブラ～プランク





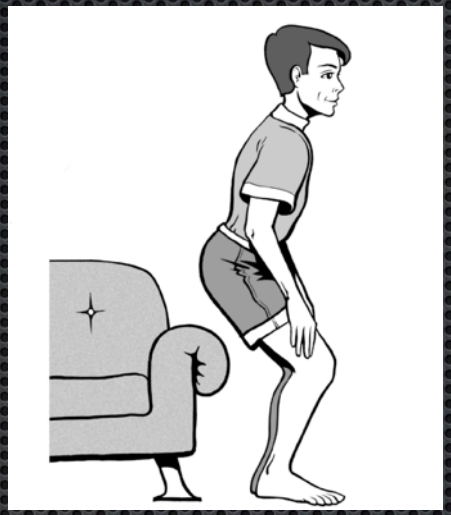


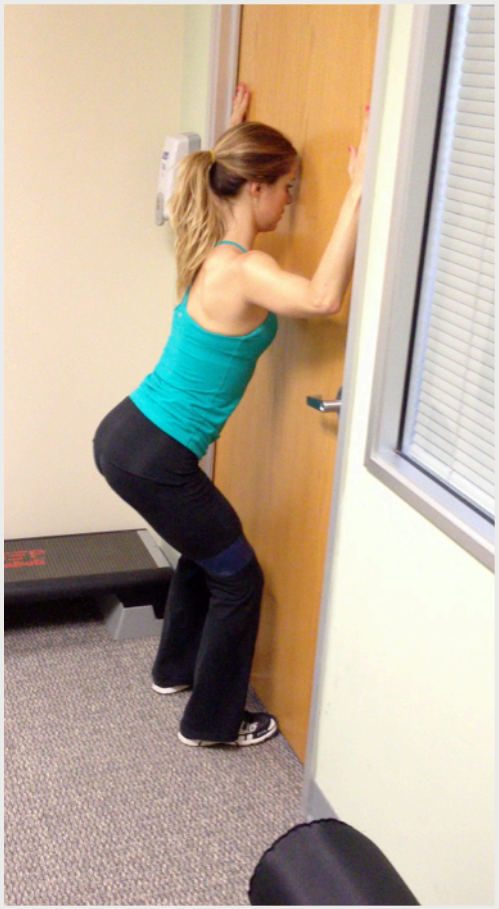
h) 四つ這い～ニーリング～スタンディング

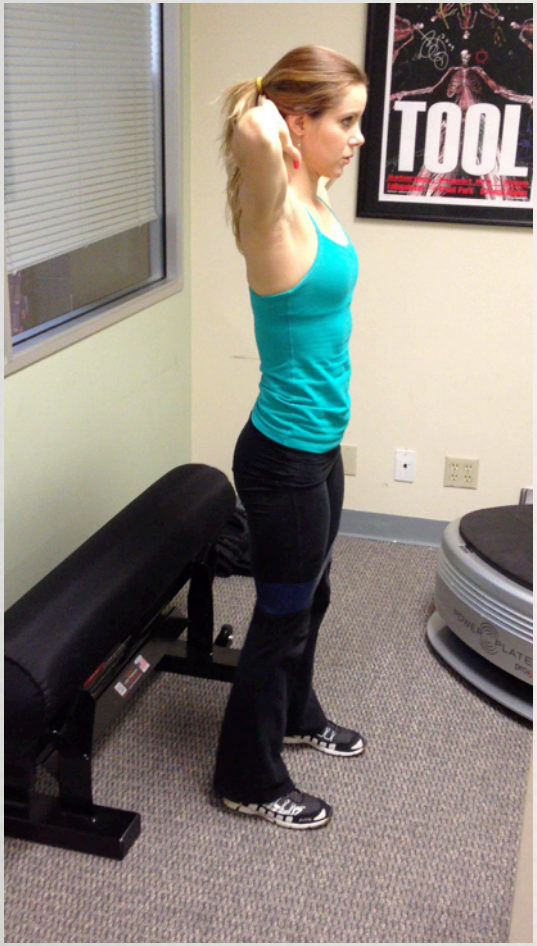


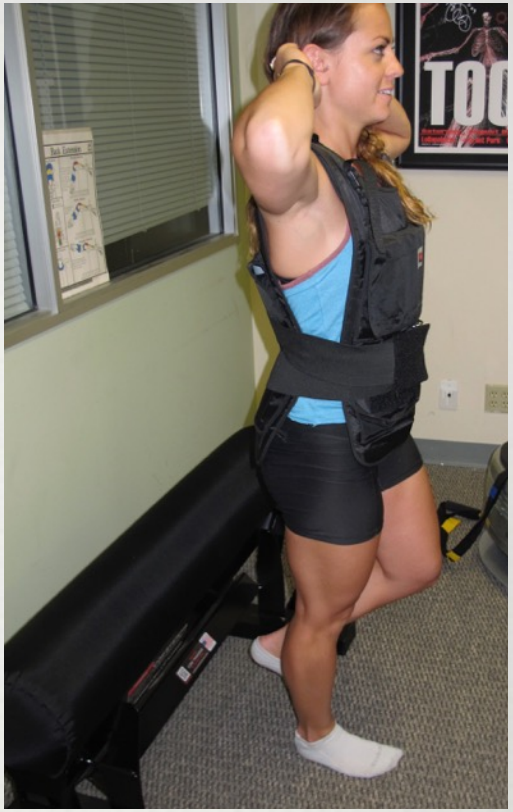
i) 椅子でのアップ／ダウン＆スクワットトレーニングのスタート

- ボックススクワット（肘かけ）
- 徒手抵抗

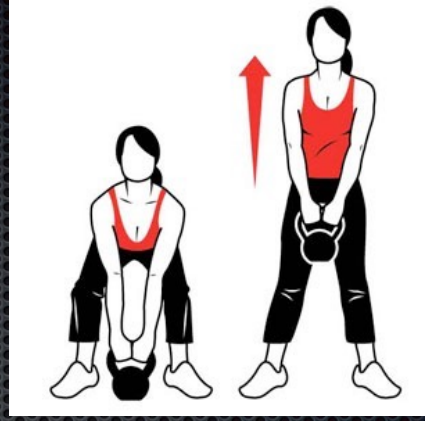








BOX SQUATS



4. デッドリフト

抗屈曲 -
ポステリアチェーン
エクササイズ

矢状面

レジステッド デッドリフト

矢状面

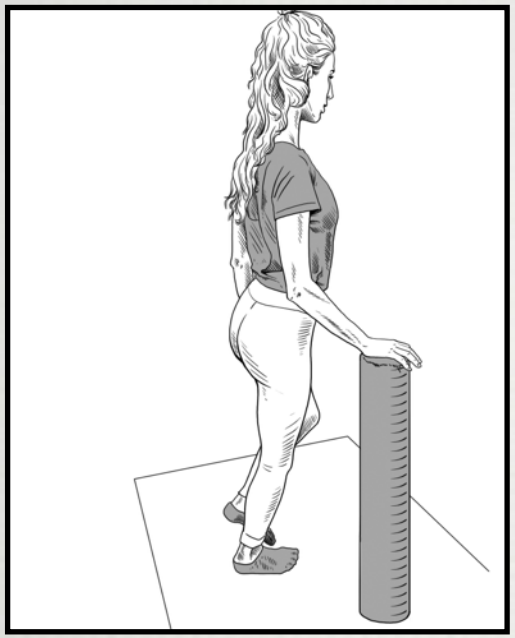
1LDL

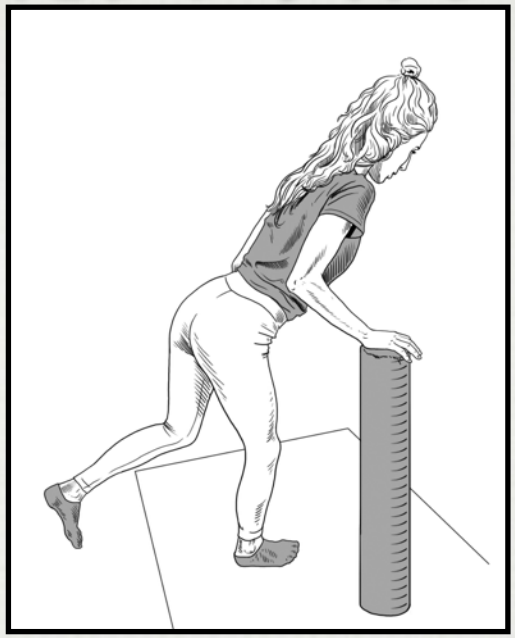
ティーター

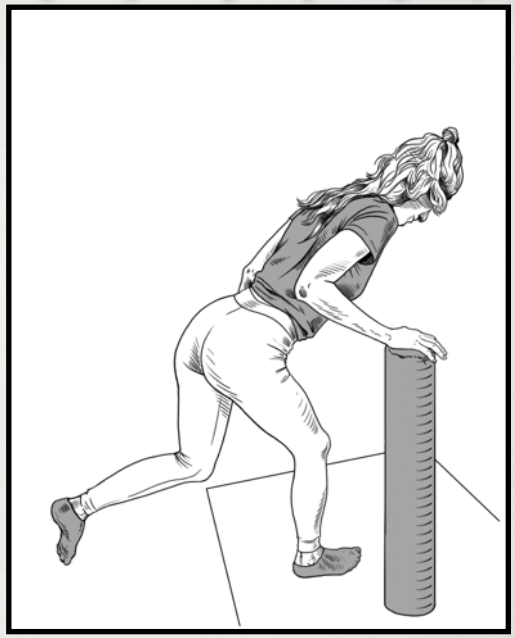
重要点

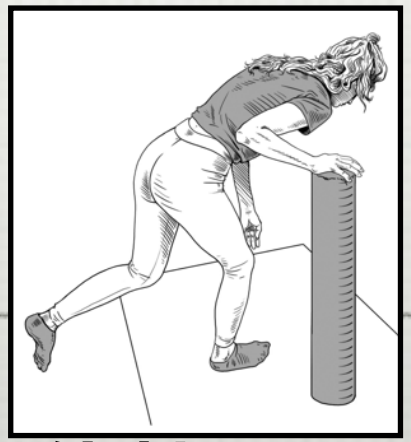
- 股関節からのヒンジ
- 脛骨を垂直に維持！
- ハムストリングスが働いているのを感じる
- 膝をロックしない
  - 膝をわずかに緩めた状態を維持する
- 腰椎の僅かな前弯を維持する
  - 腰部を丸めないようにする
  - 首の過伸展を避ける
  - 顎を引いた状態を維持する

サポートされたシングルレッグデッドリフト

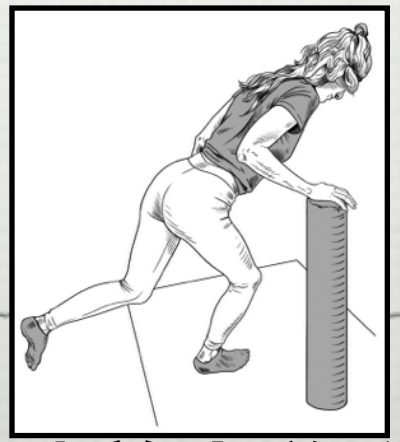








体幹屈曲



膝前方移動

リアクティブシングルレッグデッドリフト