POWER TRAINING: THE KEY TO REDUCE AGING & INCREASE QUALITY OF LIFE

JOSH HENKIN, CSCS

THANK YOU!!!

THE SANDBAG GUY?!!!

-Gym owner for over 10 years

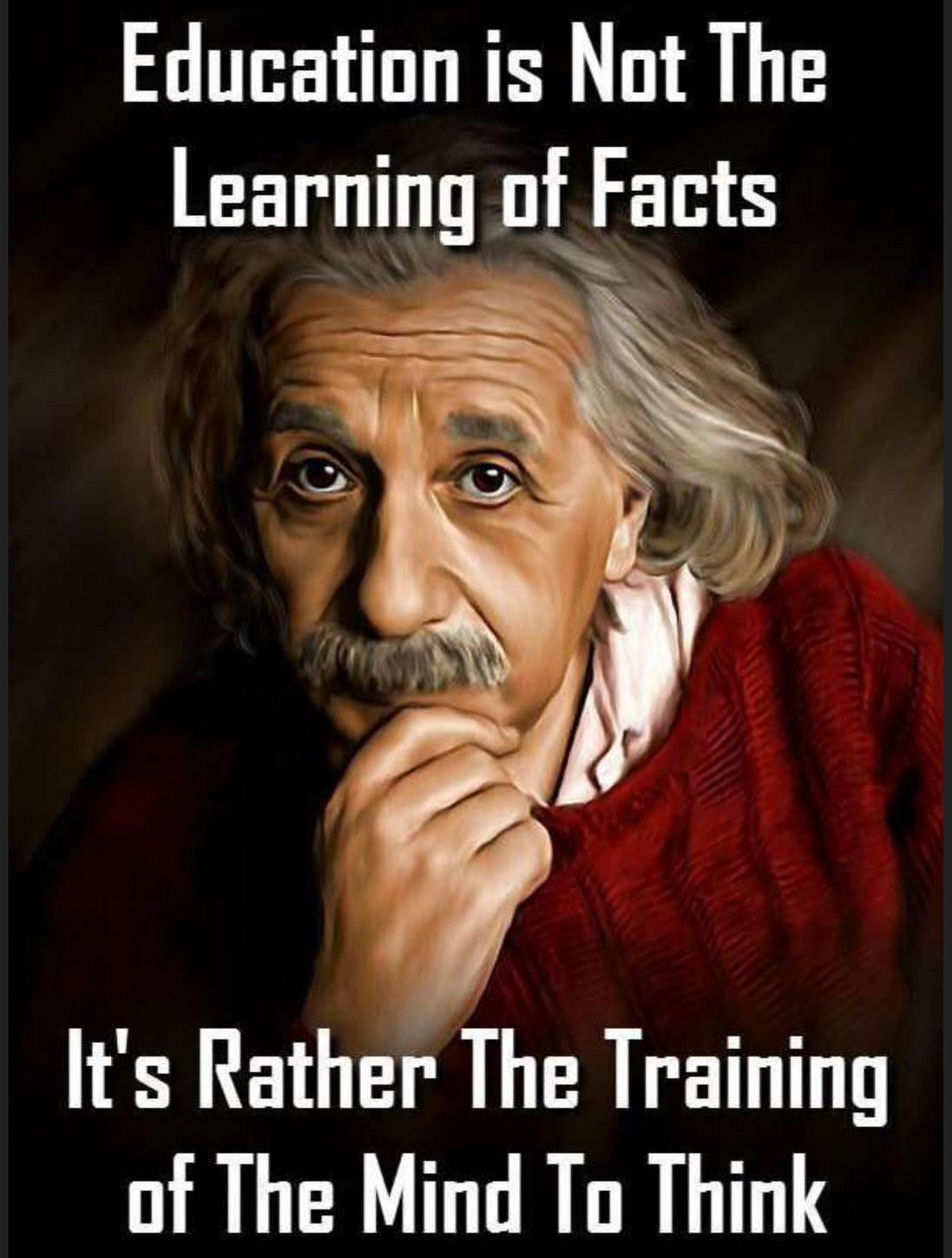
-Worked with Military & Professional Athletes But MOST Of Clients were General Population & Post-Rehab

-Presented At National Conferences For NSCA, NASM, Perform Better, DCAC, AFPA, CSCCA, NSCA-TSAC

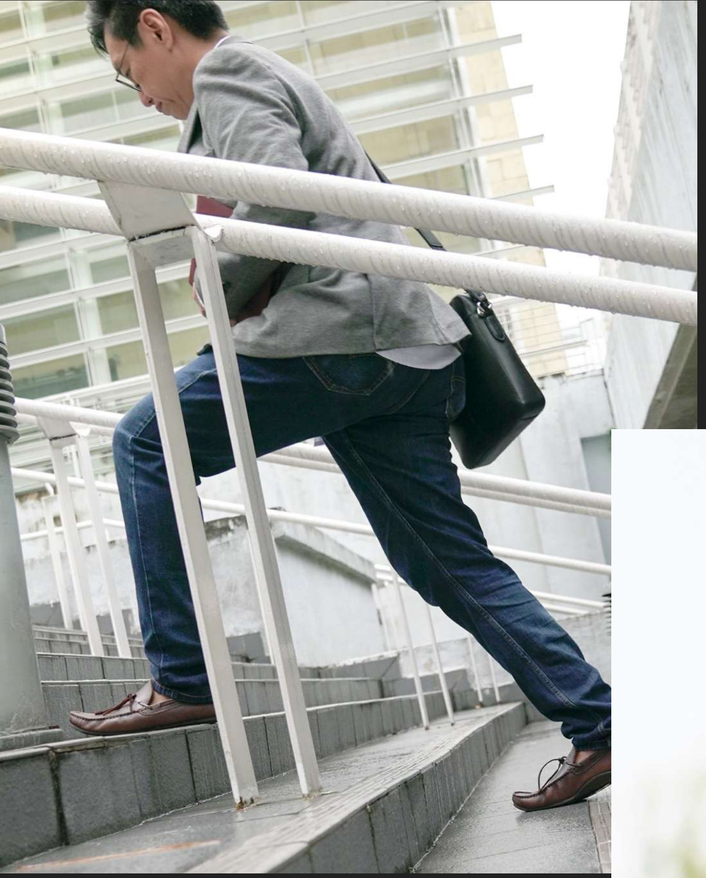
-Consultant for Equinox, EXOS, and U.S. Military

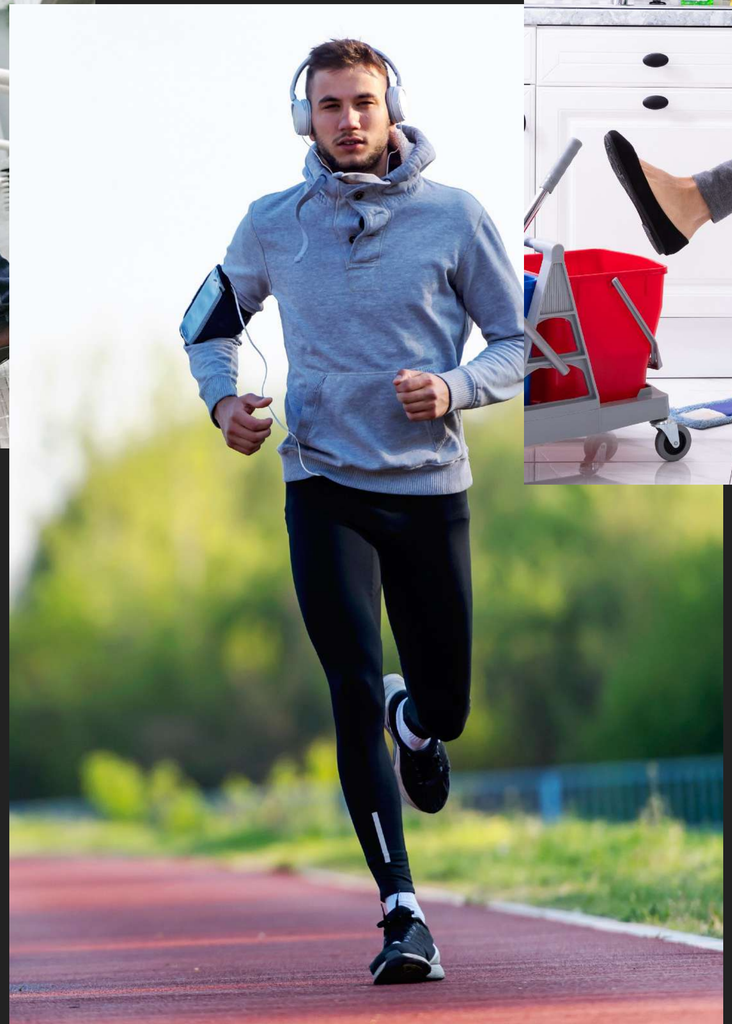
-Published In Over 12 Publications Including Men's Health, Shape, The Wall Street Journal, and others

-Presented In Over 13 Countries Worldwide


Education is Not The
Learning of Facts
It's Rather The Training
of The Mind To Think

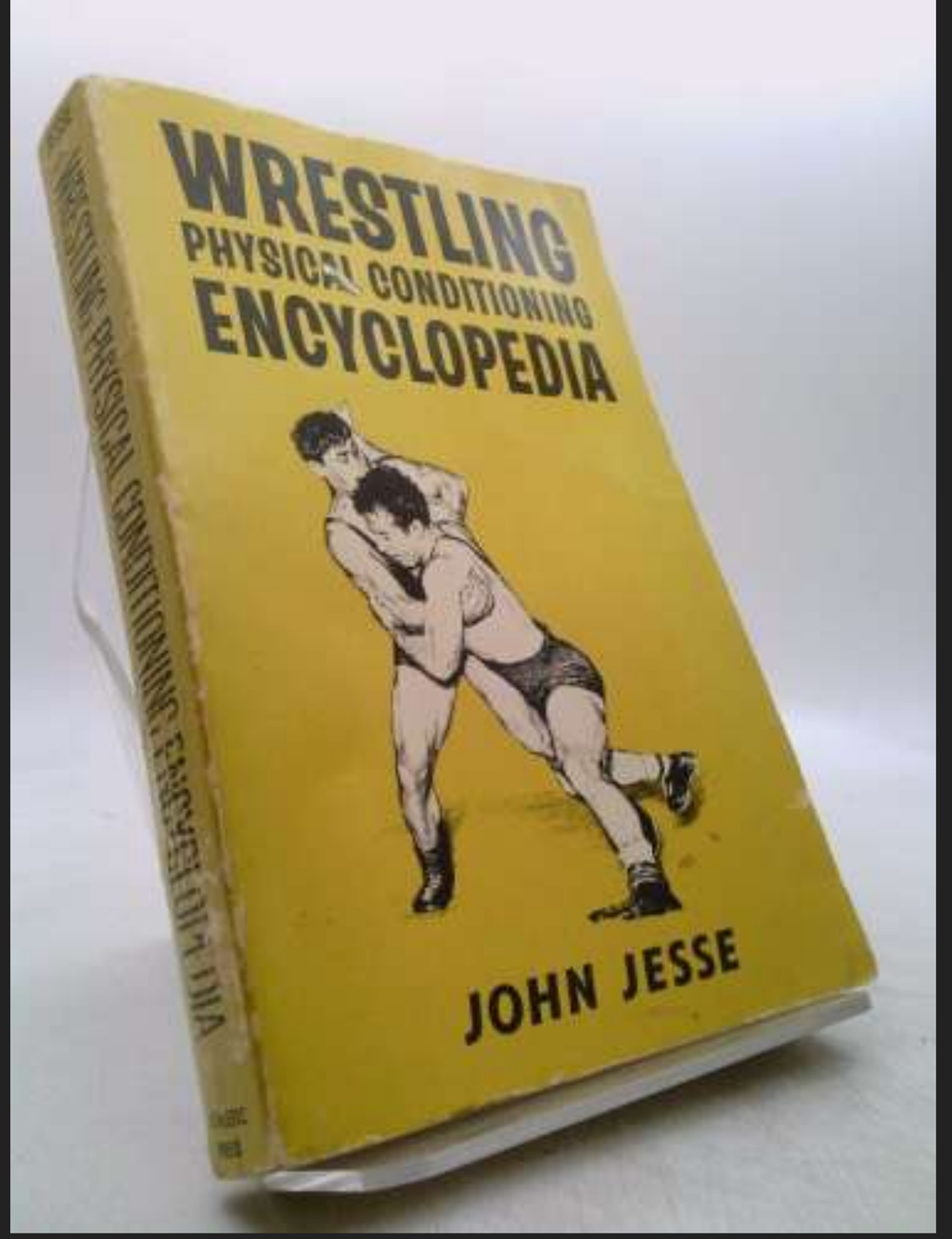

I SAW IT ON THE INTERNET
IT MUST BE TRUE





Your Clients Aren’t Athletes!

“In accepting the concept of progressive resistance training with weights, the coaching profession in the English speaking countries, particularly America and Canada, were faced with cultural problems. With machines doing most of the work the majority of young men entering athletics were not drawn from a background of labor work in the mines, on the farms, in the forests or on the docks. With increasing affluence, urbanization and mechanization, children were losing the philosophy of hard work and patience to attain a goal.”



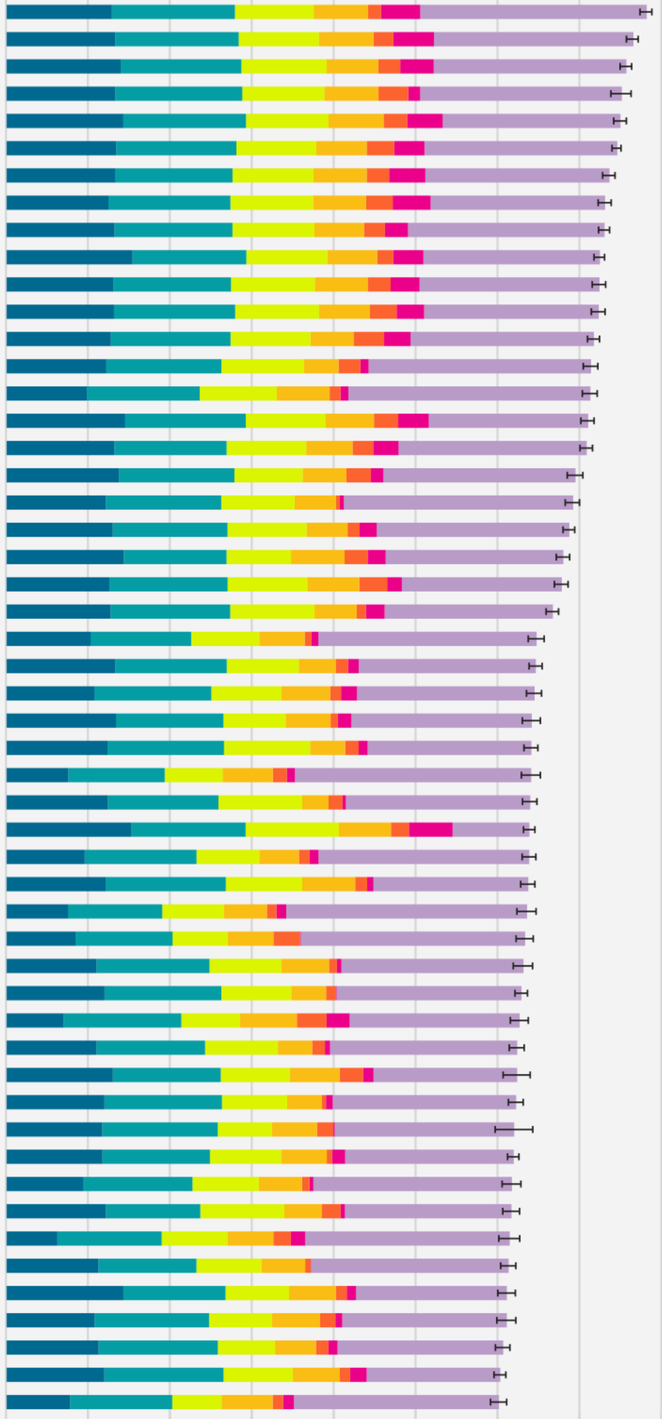
Kevin Hart Explains Why He Ended Up in a Wheelchair After a Friendly Foot Race With Former NFL Player

Attempting a 40-yard dash against former NFL player Stevan Ridley, the actor said he is "44 and sitting my ass down"

By **Nikki Dobrin** | Published on August 23, 2023 11:51PM EDT


AH, YES. HAPPINESS
I REMEMBER
makeameme.org

1. Finland (7.809)
2. Denmark (7.646)
3. Switzerland (7.560)
4. Iceland (7.504)
5. Norway (7.488)
6. Netherlands (7.449)
7. Sweden (7.353)
8. New Zealand (7.300)
9. Austria (7.294)
10. Luxembourg (7.238)
11. Canada (7.232)
12. Australia (7.223)
13. United Kingdom (7.165)
14. Israel (7.129)
15. Costa Rica (7.121)
16. Ireland (7.094)
17. Germany (7.076)
18. United States (6.940)
19. Czech Republic (6.911)
20. Belgium (6.864)
21. United Arab Emirates (6.791)
22. Malta (6.773)
23. France (6.664)
24. Mexico (6.465)
25. Taiwan Province of China (6.455)
26. Uruguay (6.440)
27. Saudi Arabia (6.406)
28. Spain (6.401)
29. Guatemala (6.399)
30. Italy (6.387)
31. Singapore (6.377)
32. Brazil (6.376)
33. Slovenia (6.363)
34. El Salvador (6.348)
35. Kosovo (6.325)
36. Panama (6.305)
37. Slovakia (6.281)
38. Uzbekistan (6.258)
39. Chile (6.228)
40. Bahrain (6.227)
41. Lithuania (6.215)
42. Trinidad and Tobago (6.192)
43. Poland (6.186)
44. Colombia (6.163)
45. Cyprus (6.159)
46. Nicaragua (6.137)
47. Romania (6.124)
48. Kuwait (6.102)
49. Mauritius (6.101)
50. Kazakhstan (6.058)
51. Estonia (6.022)
52. Philippines (6.006)



53. Hungary (6.000)
54. Thailand (5.999)
55. Argentina (5.975)
56. Honduras (5.953)
57. Latvia (5.950)
58. Ecuador (5.925)
59. Portugal (5.911)
60. Jamaica (5.890)
61. South Korea (5.872)
62. Japan (5.871)
63. Peru (5.797)
64. Serbia (5.778)
65. Bolivia (5.747)
66. Pakistan (5.693)
67. Paraguay (5.692)
68. Dominican Republic (5.689)
69. Bosnia and Herzegovina (5.674)
70. Moldova (5.608)
71. Tajikistan (5.556)
72. Montenegro (5.546)
73. Russia (5.546)
74. Kyrgyzstan (5.542)
75. Belarus (5.540)
76. Northern Cyprus (5.536)
77. Greece (5.515)
78. Hong Kong S.A.R. of China (5.510)
79. Croatia (5.505)
80. Libya (5.489)
81. Mongolia (5.456)
82. Malaysia (5.384)
83. Vietnam (5.353)
84. Indonesia (5.286)
85. Ivory Coast (5.233)
86. Benin (5.216)
87. Maldives (5.198)
88. Congo (Brazzaville) (5.194)
89. Azerbaijan (5.165)
90. Macedonia (5.160)
91. Ghana (5.148)
92. Nepal (5.137)
93. Turkey (5.132)
94. China (5.124)
95. Turkmenistan (5.119)
96. Bulgaria (5.102)
97. Morocco (5.095)
98. Cameroon (5.085)
99. Venezuela (5.053)
100. Algeria (5.005)
101. Senegal (4.981)
102. Guinea (4.949)
103. Niger (4.910)
104. Laos (4.889)

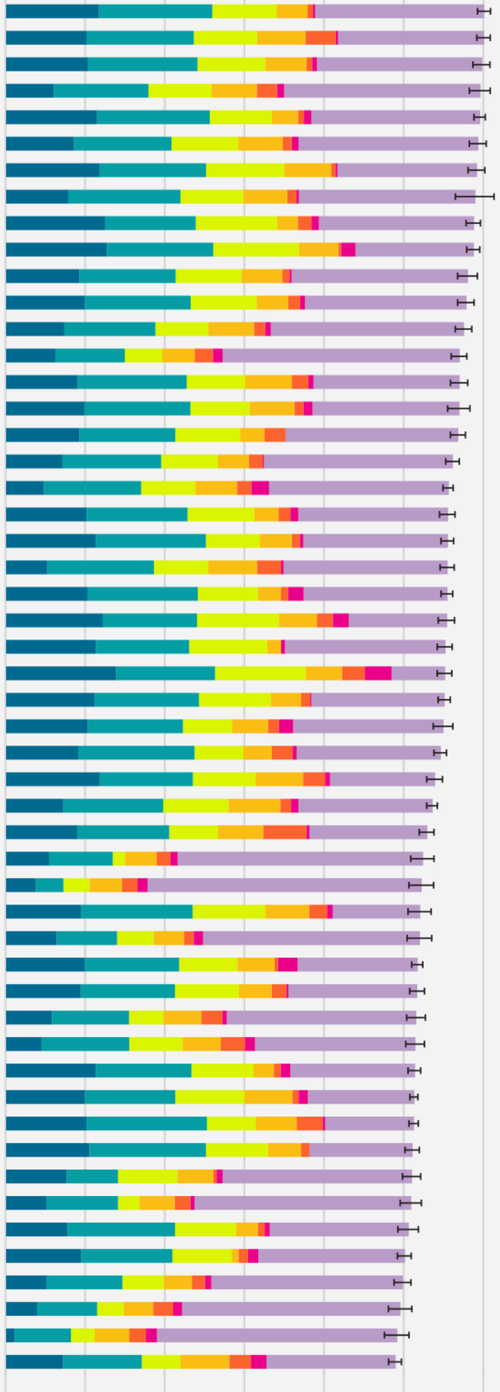


Figure 5.1: General happiness, U.S. adults, General Social Survey, 1973-2016

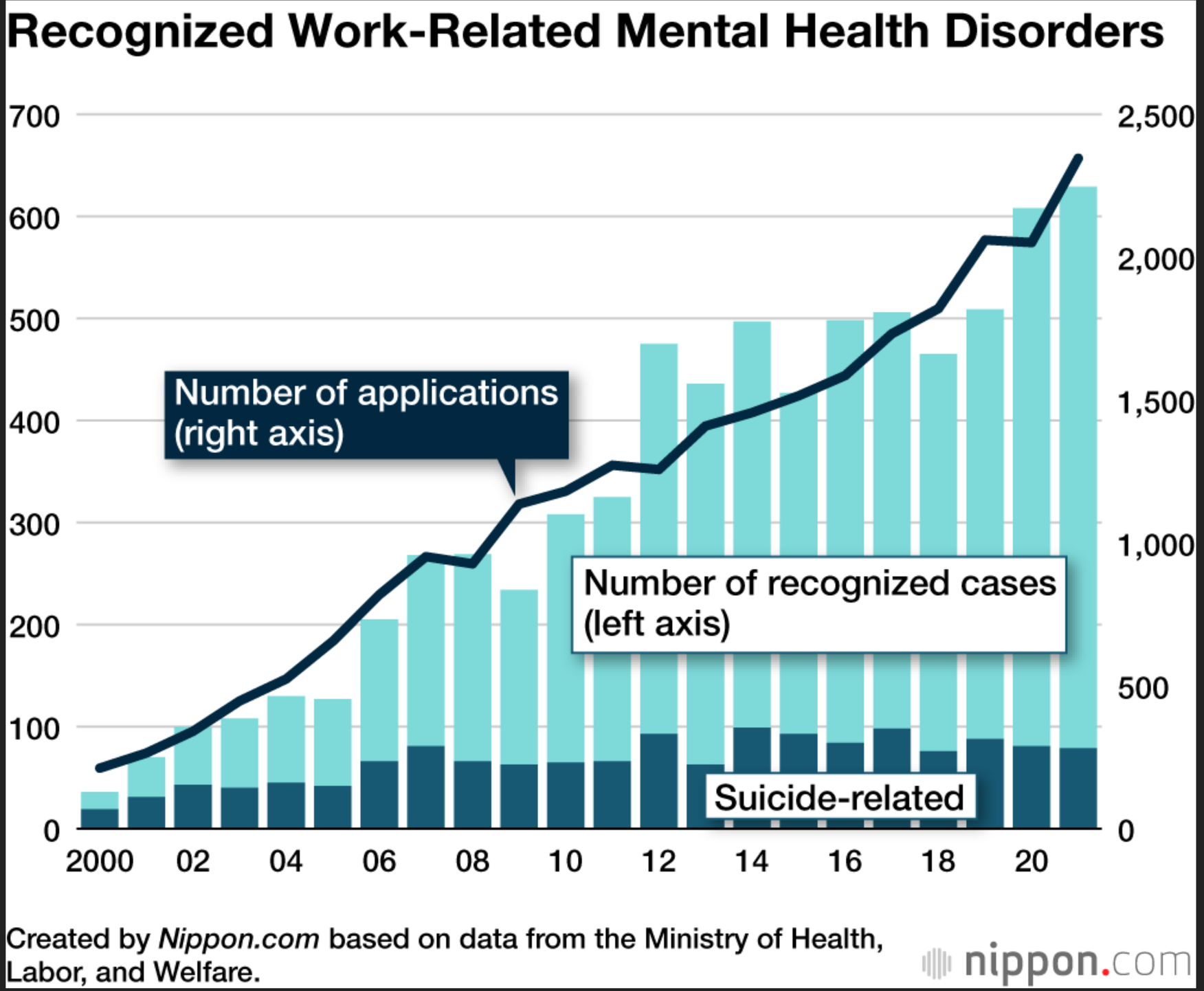
"We know that up to 80% of visits to primary care doctors are due to conditions that are caused or exacerbated by unmanaged stress," said psychiatrist Dr. Francoise Adan, director of the Connor Integrative Health Network of University Hospitals in Cleveland. "Being happy doesn't just make us feel better, it improves our health. It helps us eat healthier, be more active and sleep better."

Because happiness leads to healthier behaviors, it helps stave off high blood pressure and excess body fat, resulting in lower risk of stroke and cardiovascular disease, she said.

The connection between mental and physical health is reflected in many factors, said Dr. Laura Kubzansky, co-director of the Lee Kum Sheung Center for Health and Happiness at the Harvard T.H. Chan School of Public Health, also in Boston. Kubzansky co-authored a meta-analysis of 15 studies encompassing nearly 230,000 people that linked an optimistic mindset to lower risk of heart attack and stroke, as well as a lower risk of death. The 2019 review, published in *JAMA Network Open*, suggested promoting an optimistic mindset could be good preventive medicine.

"The evidence is increasingly strong," she said. "What we do about it will be an interesting question. Long before you get to the cardiologist, you and your primary care physician should be talking about your psychological state."

Recognized Work-Related Mental Health Disorders



Created by *Nippon.com* based on data from the Ministry of Health, Labor, and Welfare.

nippon.com

How to become above average in 2023

· Meditate
· Lift weights
· Fix your sleep
· Get 10k steps a day
· Stop drinking alcohol
· Don't be easily offended
· Learn how to deal with emotions
· Work on a goal worthy of your attention
· Spend more time in nature without a phone

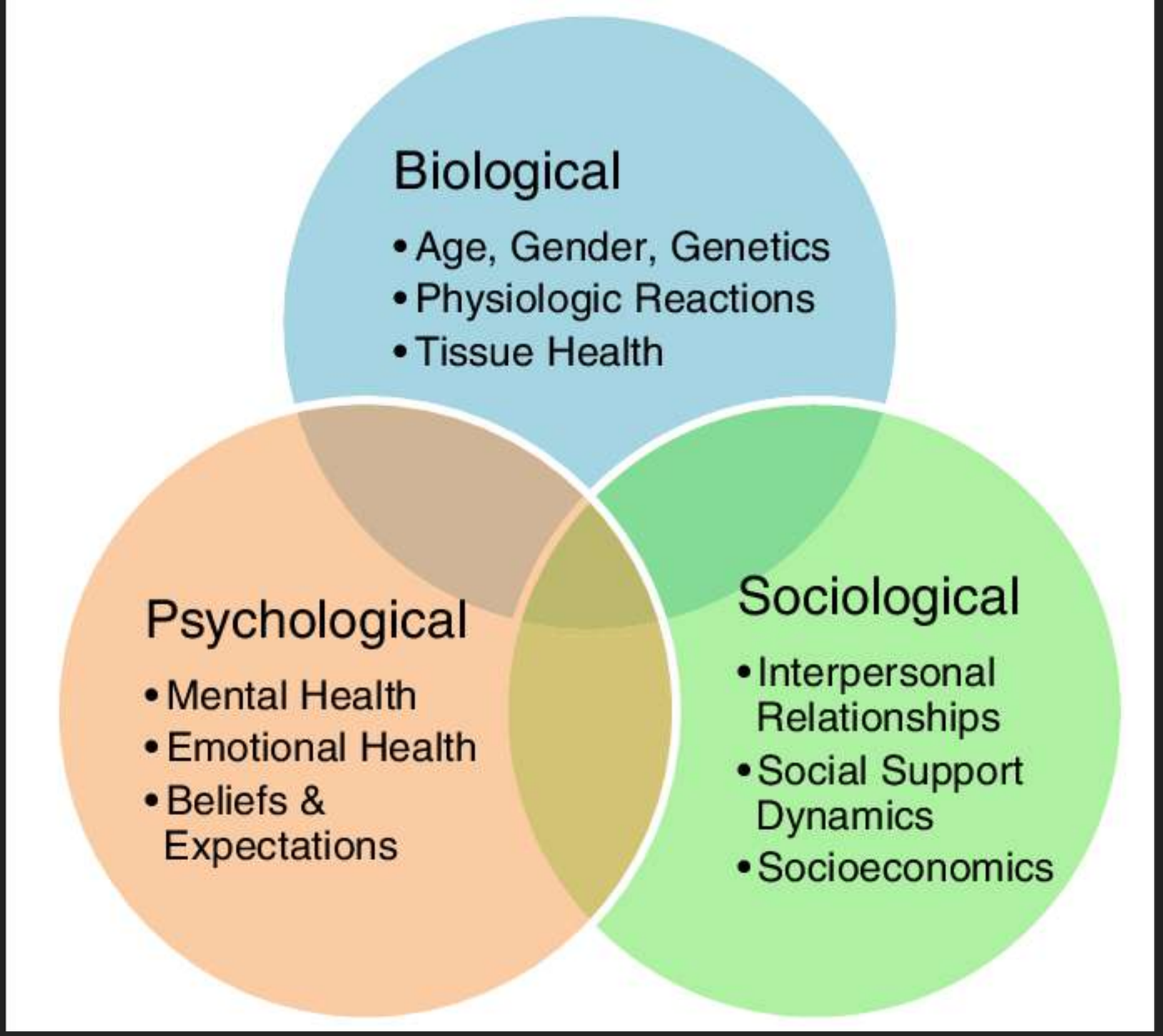
WHAT IS HEALTH?

So let's return to the original question: what is health? According to the Oxford English dictionary, the word "health" originated from the Old English hælth, which is of Germanic origin (before the 12th century), meaning whole. Since I am a physician, I personally like the definition of health described by the World Health Organization's 1948 declaration: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." The physical, emotional, and social well-being are interdependent to give us the concept of health.

Ariana then opened up about how she'd been at "the lowest point" of her life when fans assumed she looked healthiest.

Angela Weiss / AFP via Getty Images

"I was on a lot of antidepressants and drinking on them and eating poorly and at the lowest point of my life when I looked the way you consider my 'healthy,'" she said. "But that in fact wasn't my healthy. I know I shouldn't have to explain that, but I do feel like having an openness and some sort of vulnerability... something good might come from it."


Biological
• Age, Gender, Genetics
• Physiologic Reactions
• Tissue Health
Psychological
• Mental Health
• Emotional Health
• Beliefs & Expectations
Sociological
• Interpersonal Relationships
• Social Support Dynamics
• Socioeconomics

Review > Physiol Behav. 2020 Sep 1;223:112964. doi: 10.1016/j.physbeh.2020.112964.
Epub 2020 May 29.

Adverse Childhood Experiences and Adult Obesity: A Systematic Review of Plausible Mechanisms and Meta-Analysis of Cross-Sectional Studies

David A Wiss [1], Timothy D Brewerton [2]

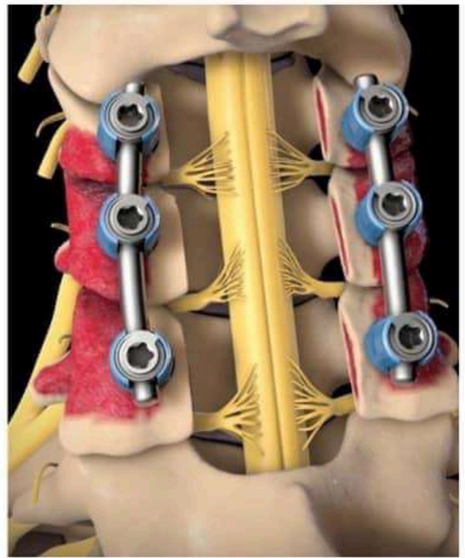
Affiliations + expand

PMID: 32479804 DOI: 10.1016/j.physbeh.2020.112964

Abstract

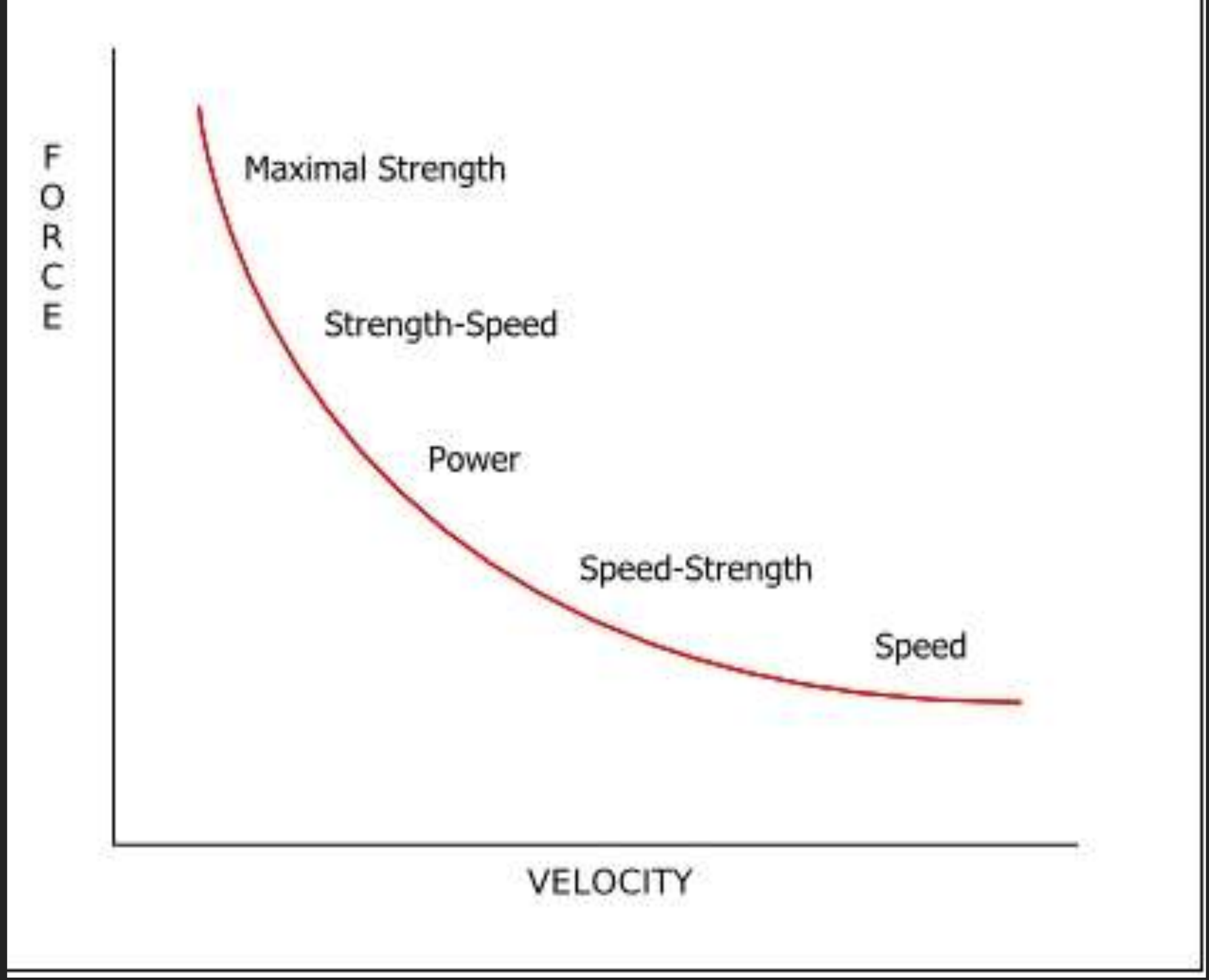
Adverse childhood experiences (ACEs) can become biologically embedded leaving a lasting signature on multiple body systems. ACE scores have been used to associate childhood adversity to a wide range of adverse health conditions over the life course, most notably substance-related disorders. Multiple studies have shown that the presence of elevated ACE scores predicts obesity in adulthood. However, a gap exists in the literature elucidating the pathways from childhood adversity to increased BMI in adulthood. We systematically reviewed these mechanisms as well as discuss novel plausible pathways. We searched PubMed, PsycInfo, Embase, and Web of Science and after applying exclusion criteria identified 18 articles for qualitative analysis. The most commonly cited mechanisms linking ACEs to obesity are social disruption, health behaviors, and chronic stress response. Ten observational studies (n=118,691) were quantitatively summarized and demonstrated a positive association between ACE and adult obesity with a pooled odds ratio of 1.46 (CI=1.28, 1.64) with moderate heterogeneity (I^2=70.8%). Our results found a 46% increase in the odds of adult obesity following exposure to multiple ACEs. Based on our qualitative synthesis and review of the most recent relevant literature, we propose biologically plausible explanations for the significant positive relationship between ACEs and adult obesity. Reducing exposure to ACEs, improved screening and detection of trauma, better access to trauma-informed care, and improvements to the food environment are likely to improve downstream health outcomes related to eating behavior.

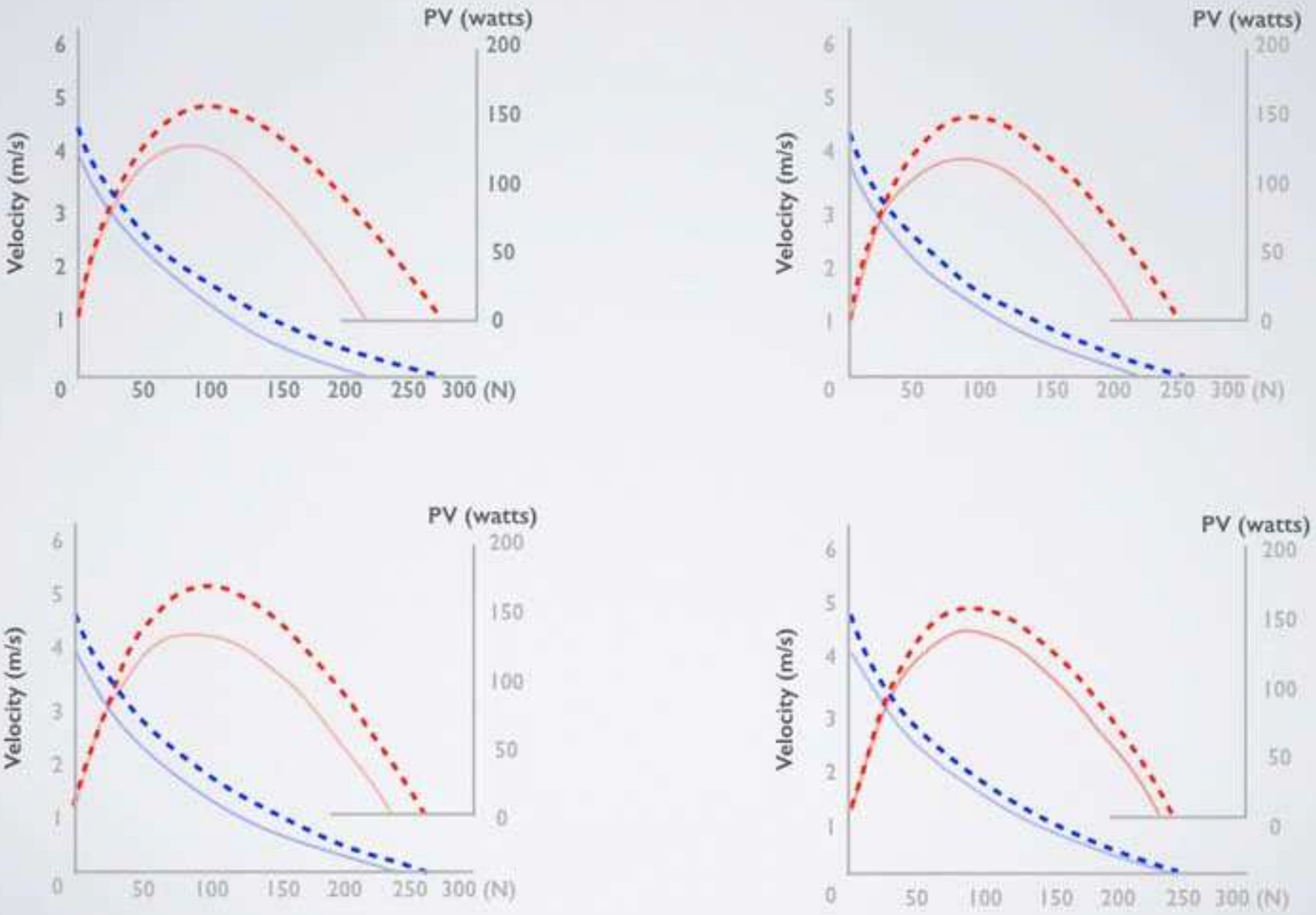
WHY IS THIS IMPORTANT TO ME?




Aspen

SO, WHAT IS POWER?

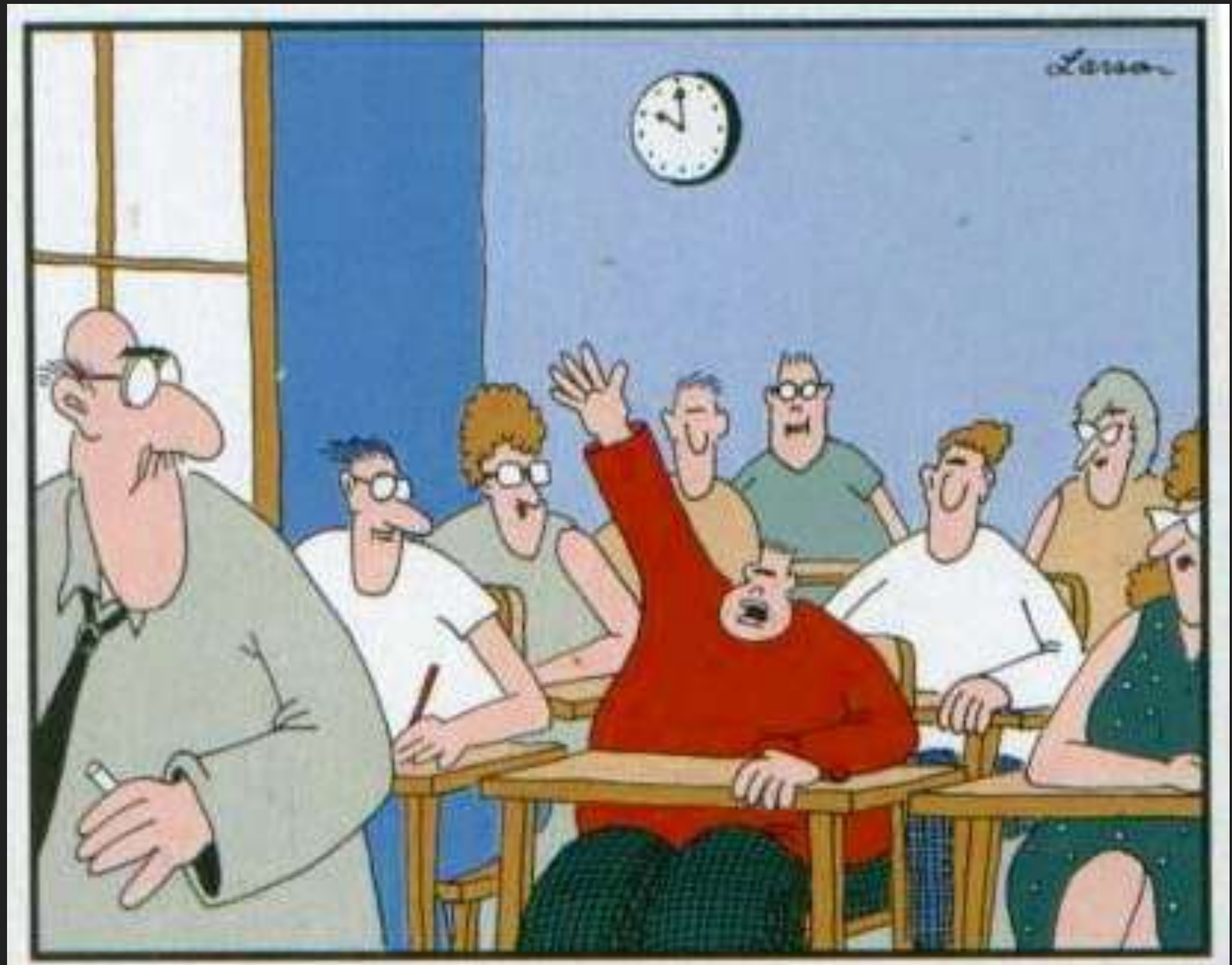

FORCE
Maximal Strength
Strength-Speed
Power
Speed-Strength
Speed
VELOCITY



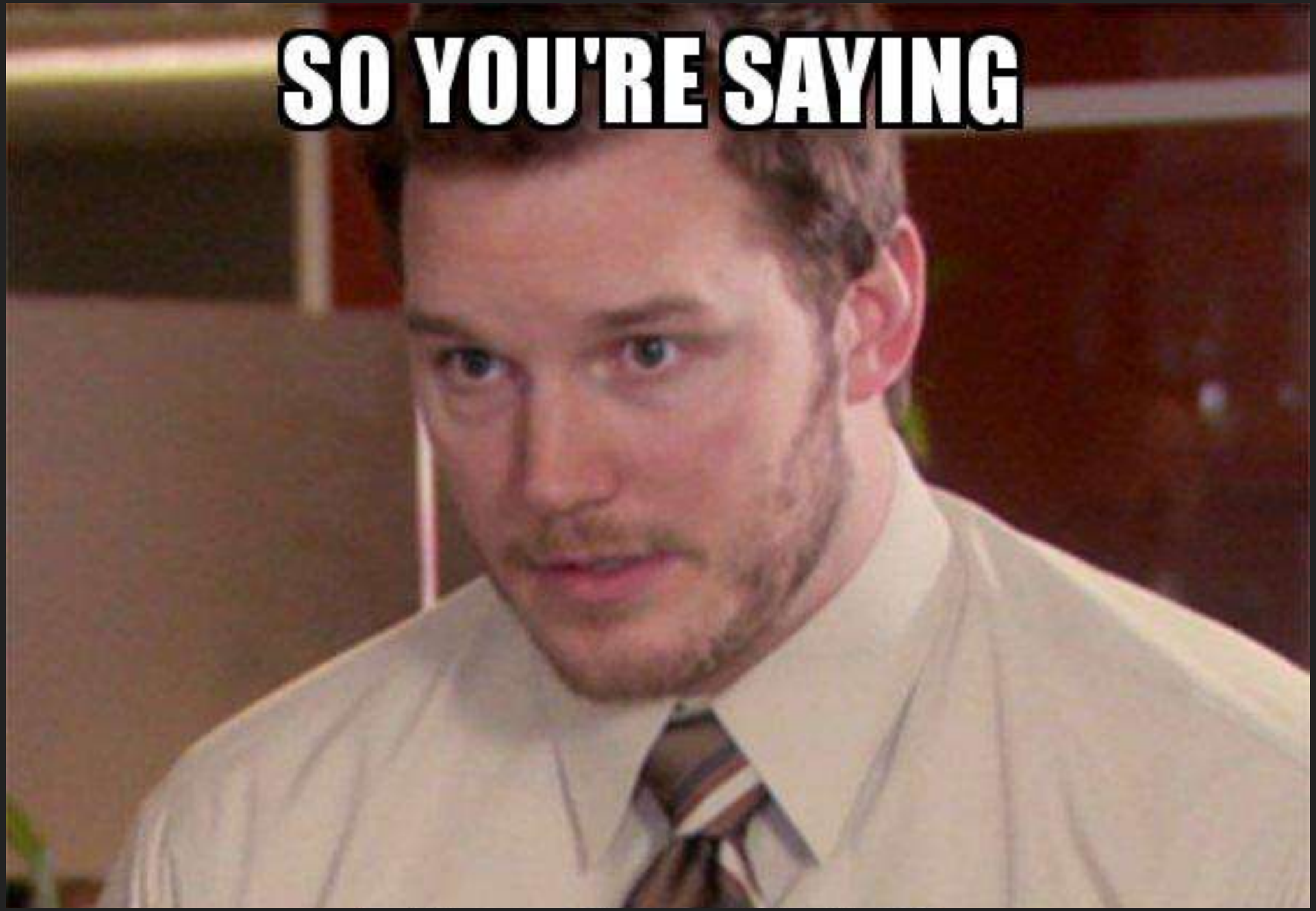
Modified from Kaneko 1983

Table 2. Countermovement vertical jumps (mean ± *SD*).*

Variable	Power lifters	Olympic lifters	Sprinters	Controls
CBW				
Peak force (N)	1,854.2 ± 49.4	2,022.9 ± 58.8	1,924.9 ± 57.2	1,741.0 ± 49.8
Peak velocity ($m \cdot s^{-1}$)	2.86 ± 0.07	3.18 ± 0.08	3.17 ± 0.08	2.68 ± 0.07
Peak power (W)	4,447.1 ± 192.0	5,377.8 ± 228.2	4,906.2 ± 222.1	3,737.7 ± 193.6
Jump height (cm)	39.7 ± 2.3	48.2 ± 2.8	49.9 ± 2.7	33.7 ± 2.3
C20				
Peak force (N)	2,036.1 ± 42.3	2,226.0 ± 50.3	2,012.9 ± 48.9	1,867.8 ± 42.7
Peak velocity ($m \cdot s^{-1}$)	2.55 ± 0.06	2.89 ± 0.07	2.83 ± 0.07	2.41 ± 0.06
Peak power (W)	4,452.4 ± 146.1	5,386.4 ± 173.7	4,809.3 ± 169.1	3,789.6 ± 147.4
Jump height (cm)	30.4 ± 1.4	35.6 ± 1.7	36.5 ± 1.7	25.8 ± 1.5
C40				
Peak force (N)	2,190.8 ± 34.0	2,357.0 ± 40.4	2,140.7 ± 39.3	1,981.4 ± 34.3
Peak velocity ($m \cdot s^{-1}$)	2.25 ± 0.05	2.48 ± 0.06	2.51 ± 0.06	2.10 ± 0.05
Peak power (W)	4,301.0 ± 144.9	5,050.0 ± 172.3	4,747.4 ± 167.6	3,631.7 ± 146.1
Jump height (cm)	22.1 ± 1.1	26.4 ± 1.3	27.3 ± 1.3	18.2 ± 1.1

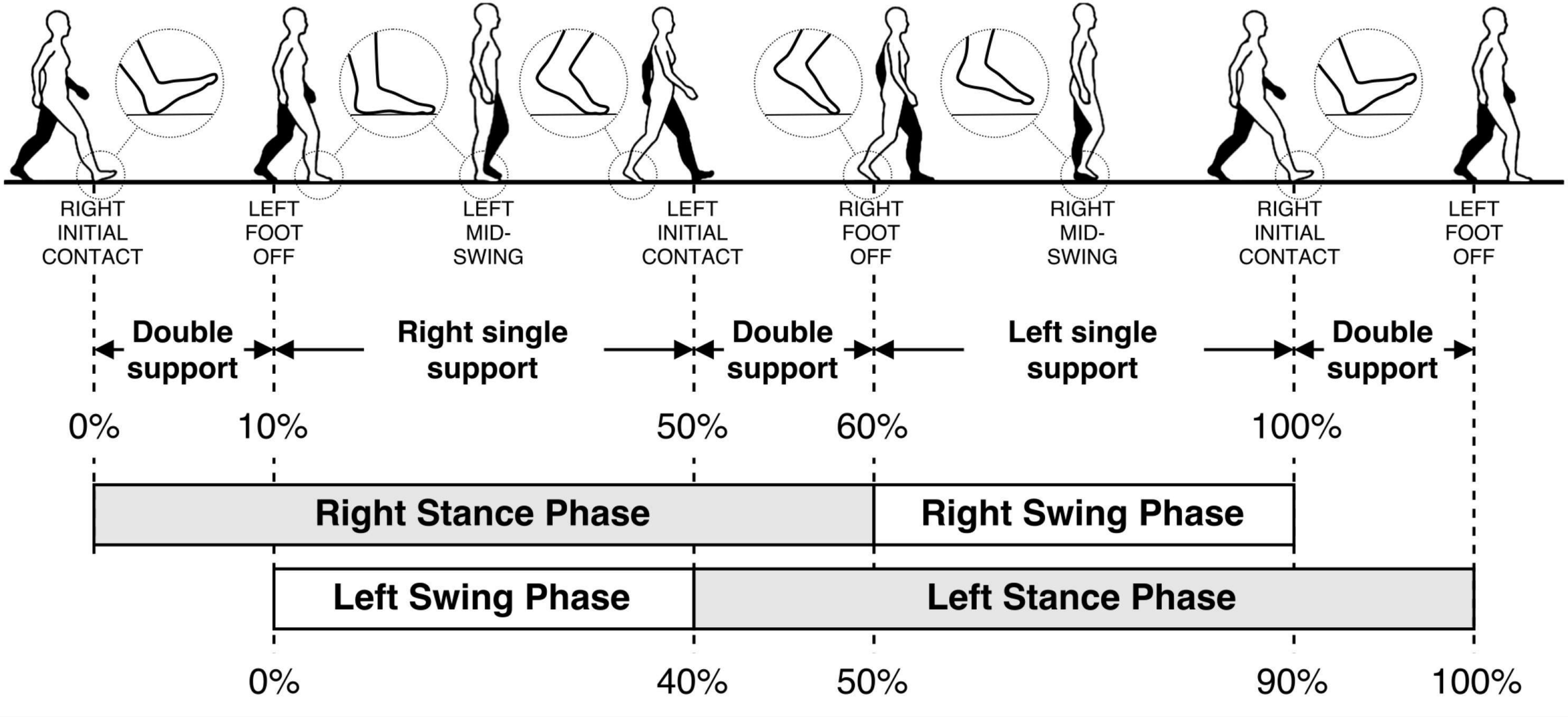


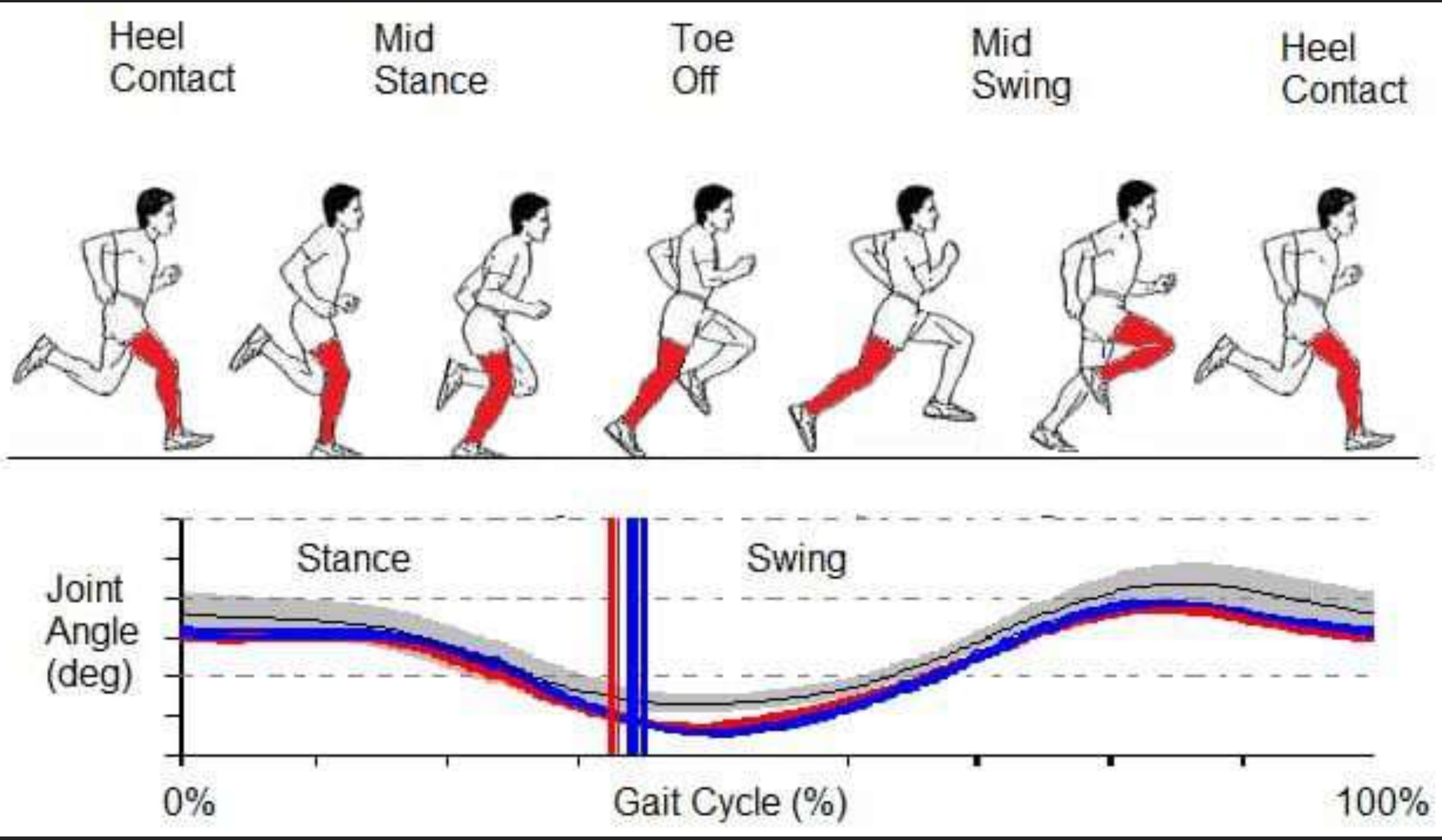
"Mr. Osborne, may I be excused?
My brain is full."


SO YOU'RE SAYING

HEALTH BENEFITS OF POWER TRAINING

- The mechanical and metabolic damage created by power training signals the body to increase levels of the anabolic hormones testosterone, growth hormone and insulin-like growth factor.
- Power training can help develop stronger, more resilient connective tissue; specifically tendons, ligaments, fascia and joint capsules, which reduces the risk of injury from sprains or strains.
- Power training can help older adults improve their quality of life and maintain functional independence during the later years of the aging process.
- Power increases rate of force development which has greater carry over to activities of daily living.


RIGHT INITIAL CONTACT
LEFT FOOT OFF
LEFT MID-SWING
LEFT INITIAL CONTACT
RIGHT FOOT OFF
RIGHT MID-SWING
RIGHT INITIAL CONTACT
LEFT FOOT OFF
Double support
Right single support
Double support
Left single support
Double support
0%
10%
50%
60%
100%
Right Stance Phase
Right Swing Phase
Left Swing Phase
Left Stance Phase
0%
40%
50%
90%
100%


Heel Contact
Mid Stance
Toe Off
Mid Swing
Heel Contact
Stance
Swing
Joint Angle (deg)
0%
Gait Cycle (%)
100%

Gait & Posture
Volume 62, May 2018, Pages 303-310

Full length article

Lower extremity power training improves healthy old adults' gait biomechanics

Azusa Uematsu [a], Tibor Hortobágyi [b], Kazushi Tsuchiya [c], Norio Kadono [d, e], Hirofumi Kobayashi [f], Tomoya Ogawa [g], Shuji Suzuki [h]

STAYING HEALTHY

Power training: A complementary approach

Power training may be even more important than strength training because muscle power declines at more than twice the rate that strength does as you age—as much as 3.5% a year for power compared with 1.5% for strength. That's why some doctors, physical therapists, and personal trainers are now combining the swift moves of power training with slower, more deliberate strength training exercises, as do the workouts in this report, to reap the benefits of both activities.

Functional Benefit of Power Training for Older Adults

in Journal of Aging and Physical Activity

Click name to view affiliation

Tom Hazell, Kenji Kenno, and Jennifer Jakobi

DOI: https://doi.org/10.1123/japa.15.3.349
Keywords: strength; ADL; independence; successful aging; sarcopenia

In Print: Volume 15: Issue 3 **Page Range:** 349–359

Abstract Author Notes

Aging leads to significant losses in muscle mass, strength, and the ability to independently perform activities of daily living (ADL). Typically, standard resistance training (RT) has been used to reduce these losses in function by maintaining or even increasing muscle strength in older adults. Increasing strength does not necessarily, however, result in an increase in the ability to perform ADL. There is now research suggesting that muscle power is more closely associated with the performance of ADL than muscle strength is, so training for muscle power might lead to more beneficial results in functional performance. This review of studies investigating the effect of training on ADL performance in older adults indicated that standard RT is effective in increasing strength in older adults, but power training that contains high-velocity contractions might be a more optimal means of training older adults when the emphasis is on increasing the performance of ADL.

J Strength Cond Res. Author manuscript; available in PMC 2015 Mar 1. *Published in final edited form as:* J Strength Cond Res. 2014 Mar; 28(3): 616–621.
doi: 10.1519/JSC.0b013e3182a361b8

PMCID: PMC3902133 | NIHMSID: NIHMS512514 | PMID: 23897022

High-speed power training in older adults: A shift of the external resistance at which peak power is produced

Stephen P. Sayers, PhD and Kyle Gibson, PT, PhD

For example, tasks such as moving the lower limb quickly to stabilize the body after losing balance or from the accelerator to the brake while driving are encountered frequently in this population, but being trapped under a heavy object where maximum strength is required would be encountered rarely. Thus, a training regimen that increases peak power at lower external resistances would be an optimal training result for an older adult interested in practical functioning and maintaining safety with age.

Japan's population aged faster than any country over the last 30 years.

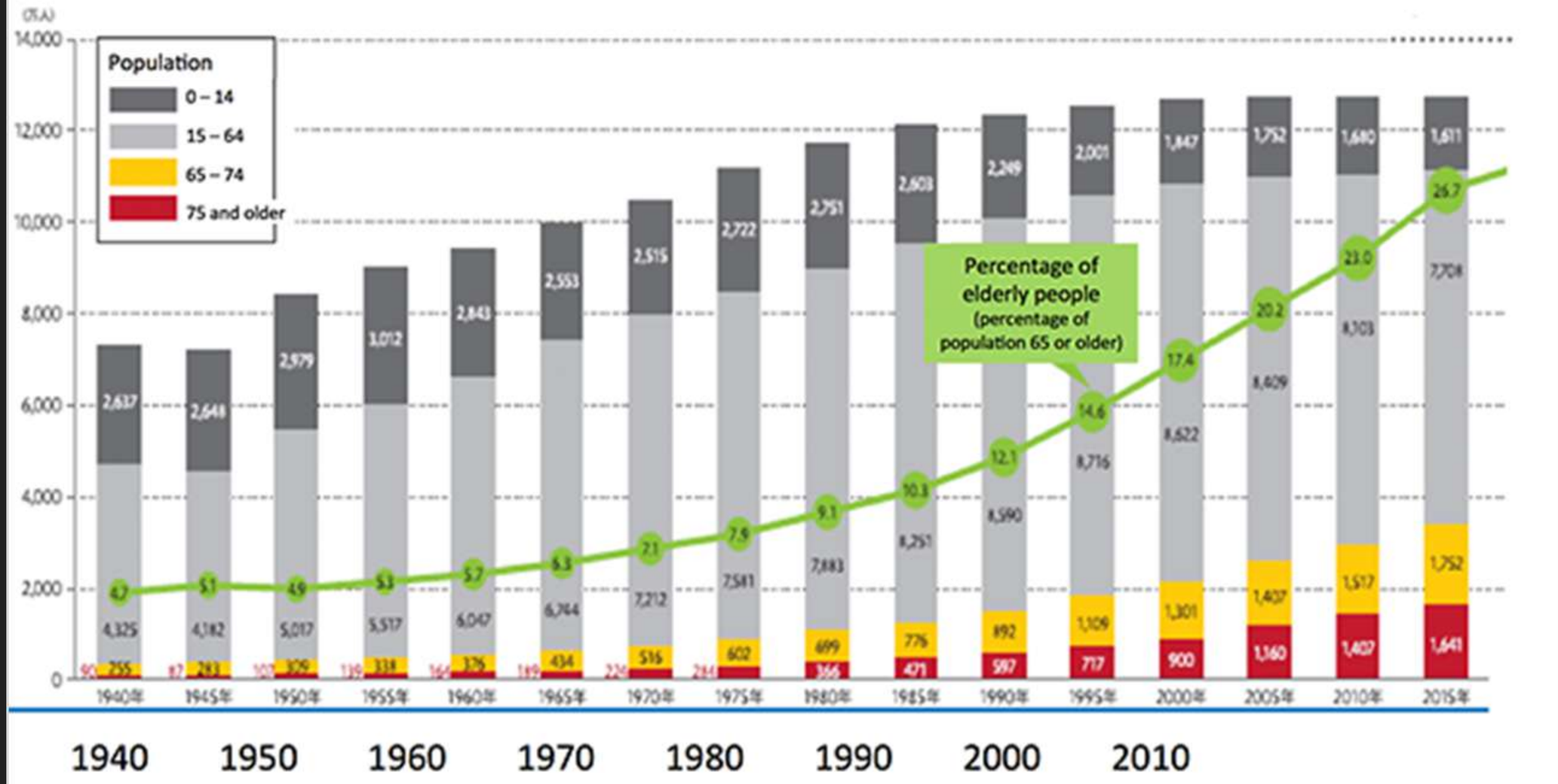
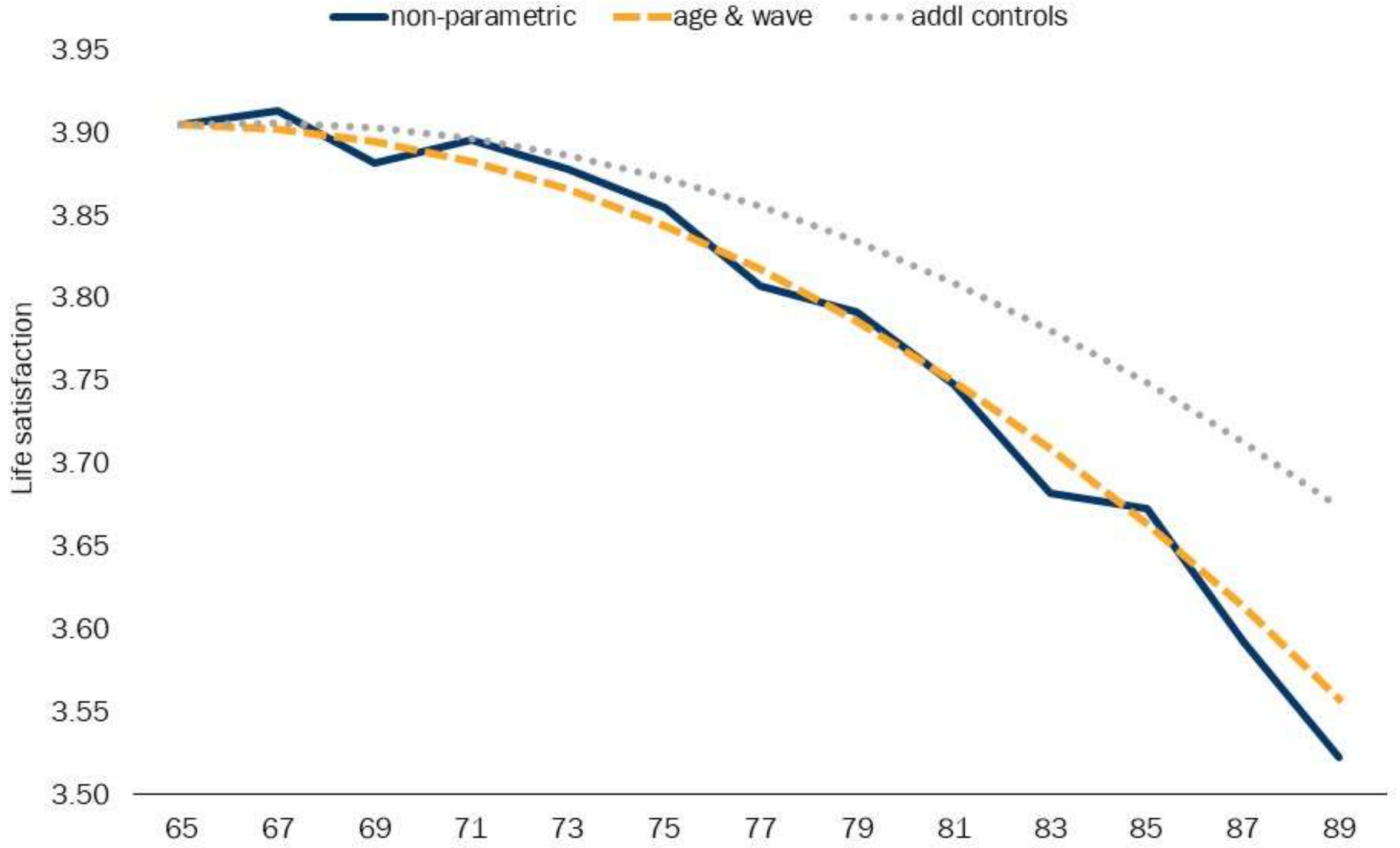
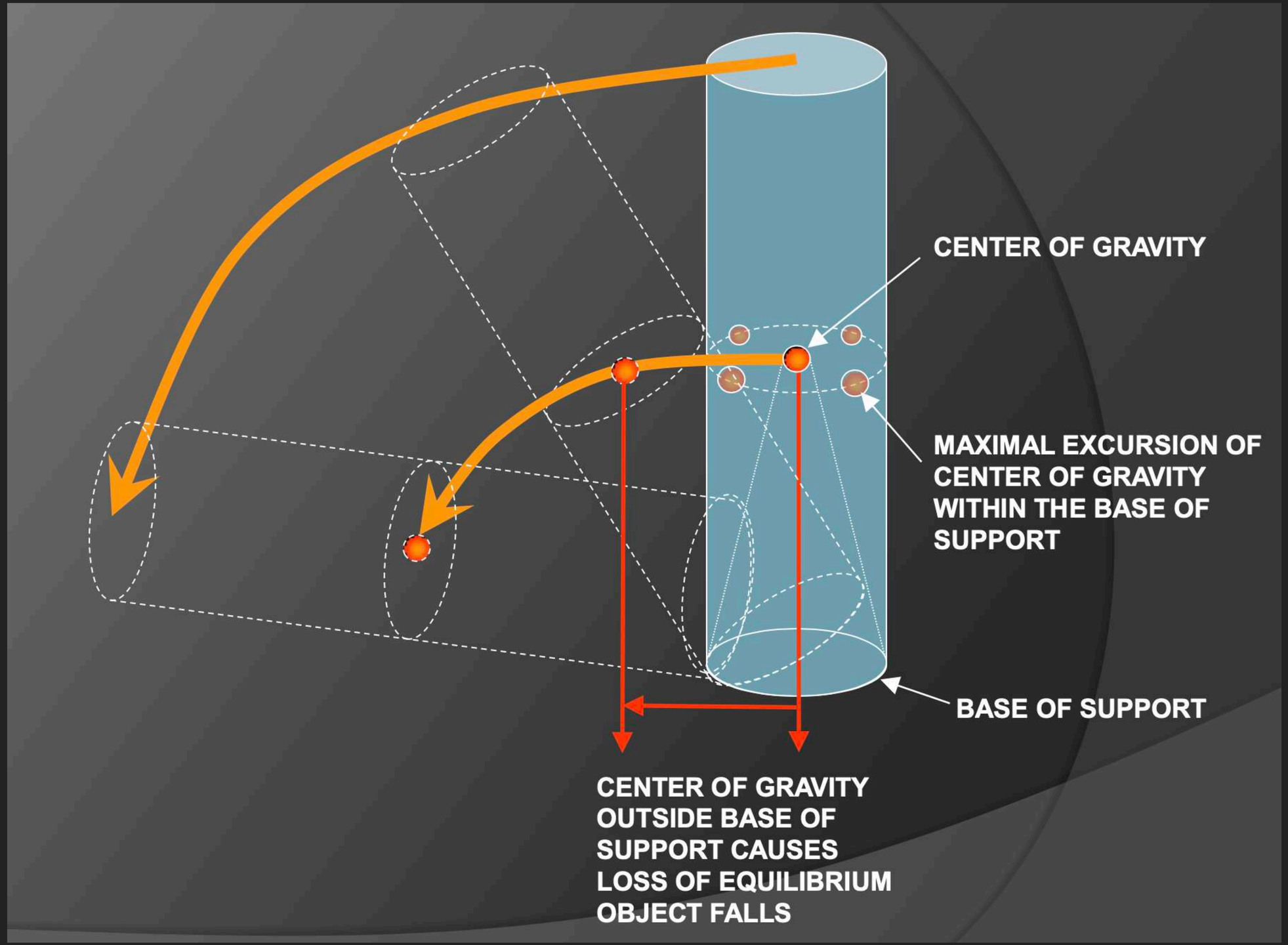


Figure 4. Average life satisfaction by age



Source: Hudomiet, Hurd and Rohwedder. (2020) Notes: The solid "non-parametric" line shows average 2-year longitudinal changes sequenced together into a single line. The dashed line shows a predicted age-profile using a first-differences panel regression model with a quadratic function of age. The dotted line shows model predictions using a similar model that includes additional demographic, labor market, and health controls.

BROOKINGS


CENTER OF GRAVITY
MAXIMAL EXCURSION OF CENTER OF GRAVITY WITHIN THE BASE OF SUPPORT
BASE OF SUPPORT
CENTER OF GRAVITY OUTSIDE BASE OF SUPPORT CAUSES LOSS OF EQUILIBRIUM OBJECT FALLS

THE TESTS

Figure 6.15 The single-leg stance balance test.

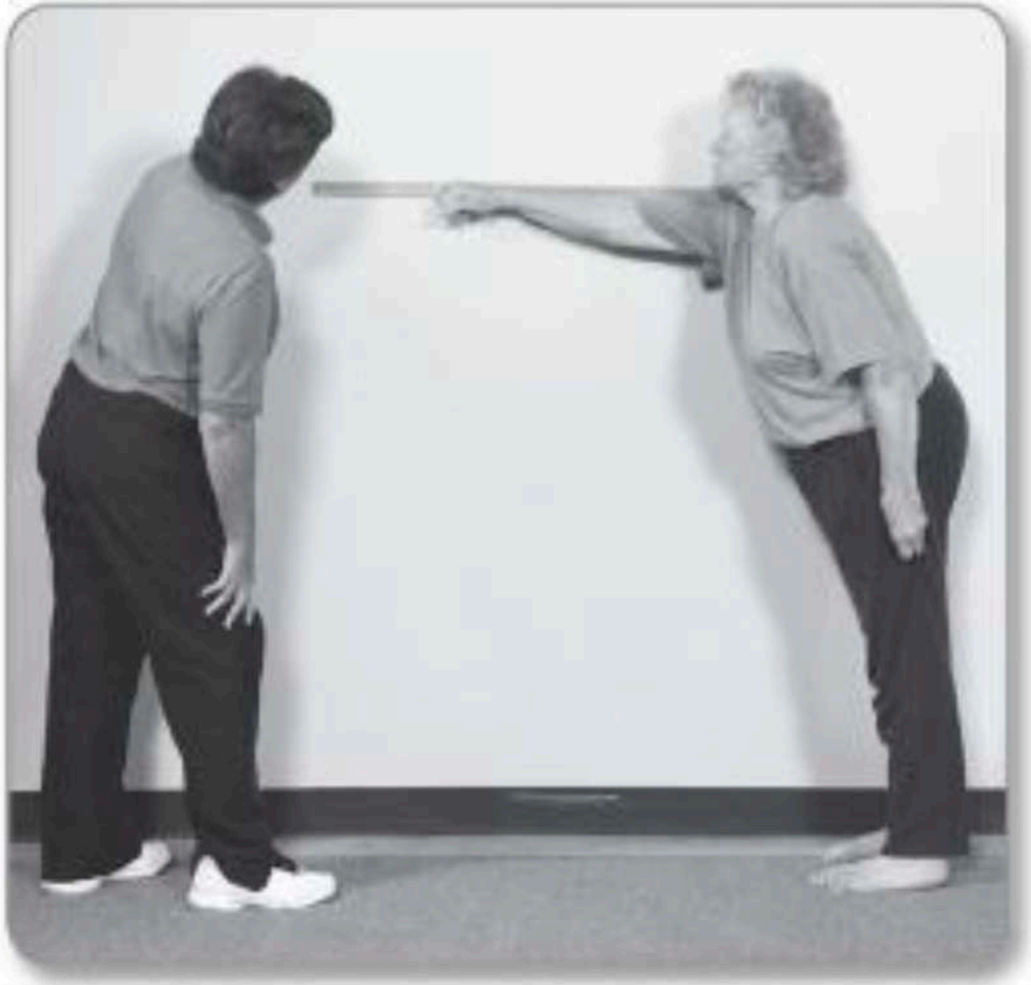


Figure 6.16 The functional reach test.

Figure 6.17 The 8-foot (2.4 m) up-and-go test.

Better Balance and Agility

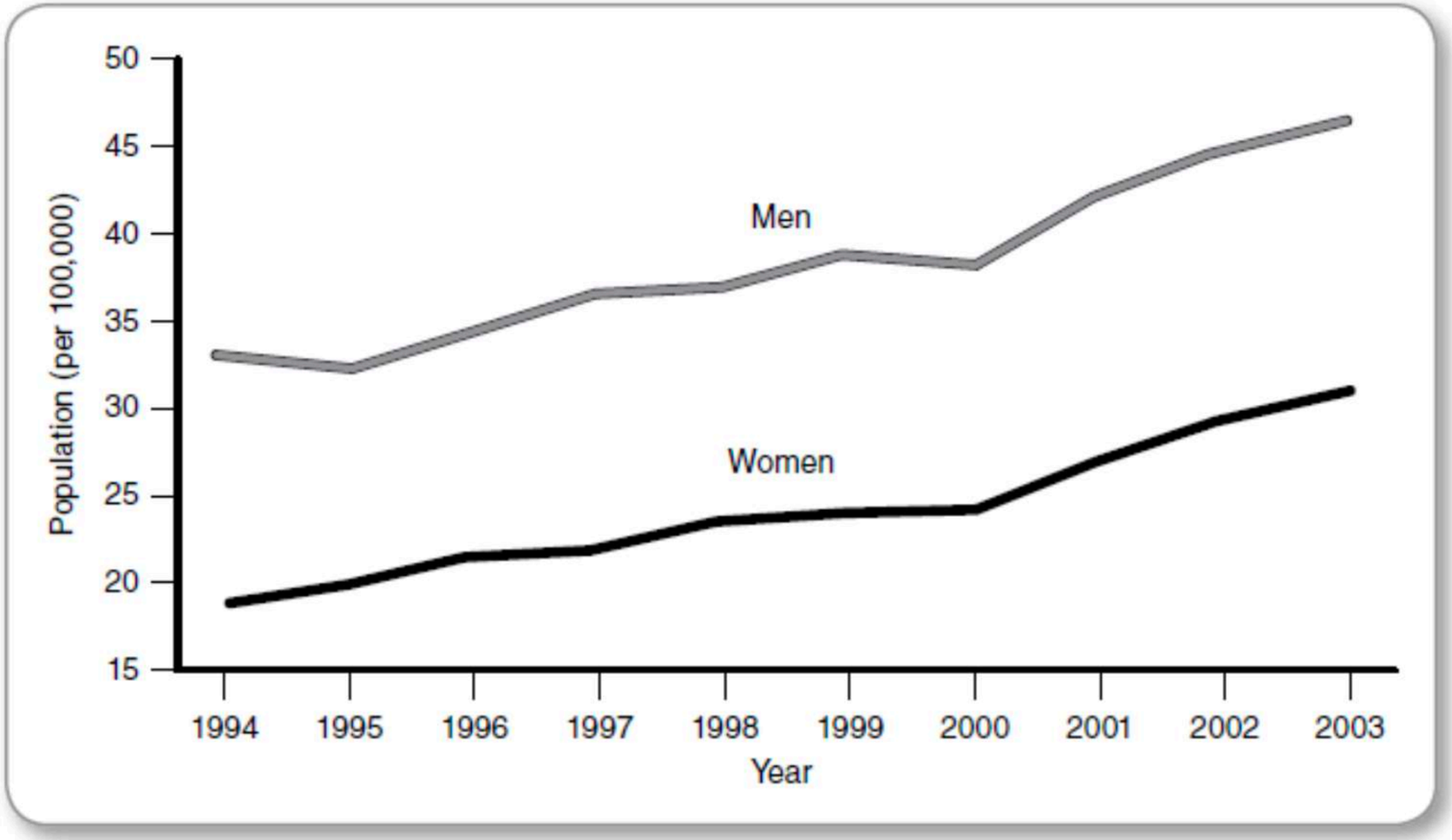


Figure 6.11 Age-adjusted fatal fall injury rates among men and women aged 65 years and older in the United States between 1994 and 2003.

Reprinted from CDC.

THE PRESCRIPTION

TARGETED

- Tai Chi
- Balance and Agility Training Programs
- Balance Platforms
- Whole Body Vibration
- Activity Promoting Video Games

SUPPORT

- Lower Body Power Training
- Speed Training
- Flexibility Training

JAMA Internal Medicine

Search All | Enter Search Term

Original Investigation

October 2018

Effectiveness of a Therapeutic *Tai Ji Quan* Intervention vs a Multimodal Exercise Intervention to Prevent Falls Among Older Adults at High Risk of Falling

A Randomized Clinical Trial

Fuzhong Li, PhD[1,2]; Peter Harmer, PhD, MPH[3]; Kathleen Fitzgerald, MD[4]; et al

» Author Affiliations | Article Information

JAMA Intern Med. 2018;178(10):1301-1310. doi:10.1001/jamainternmed.2018.3915

Limb Force, Functional Capacity, and Static and Dynamic Balance in Older Female Adults

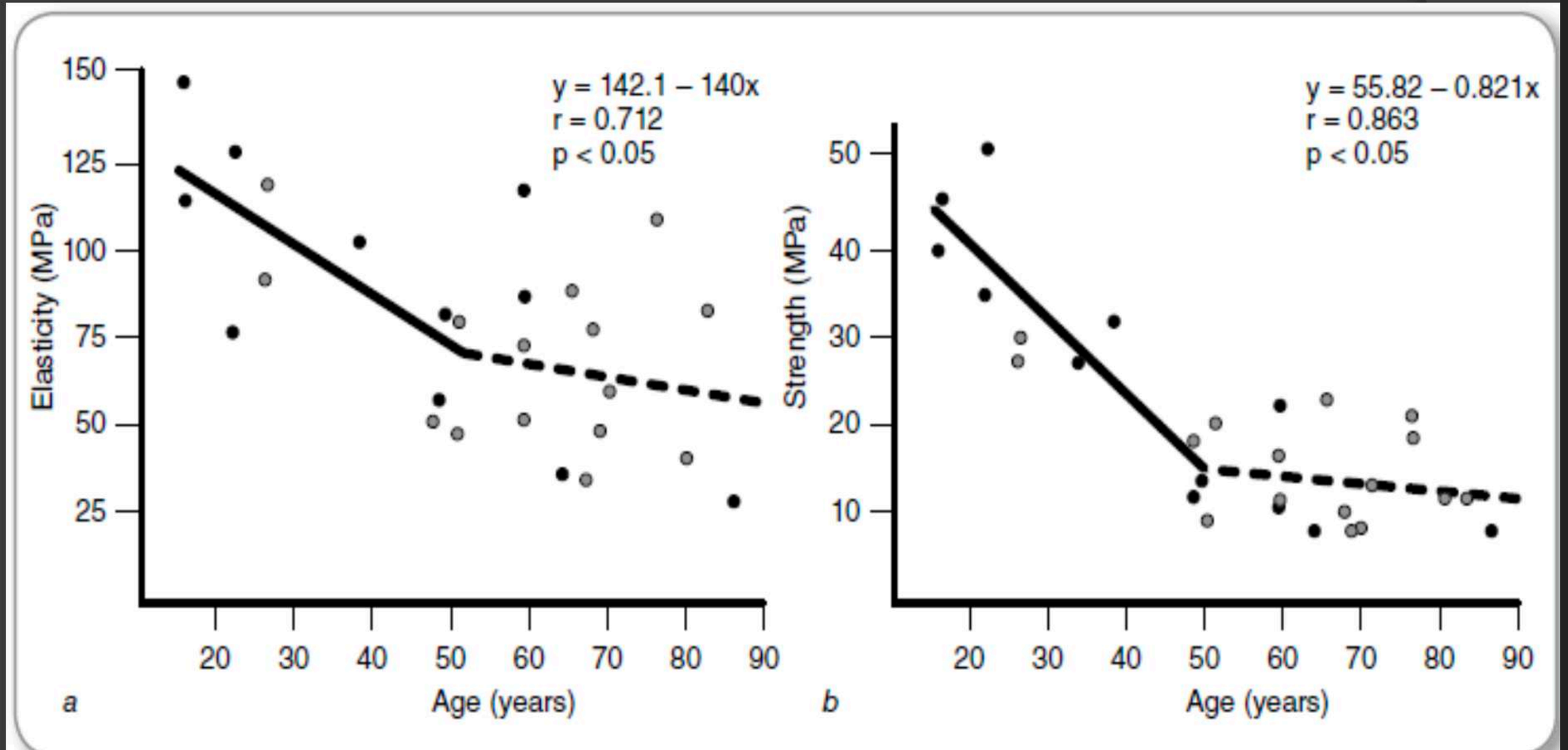
Paula Born Lopes, Gleber Pereira, Angélica Lodovico, Paulo C.B. Bento, and André L.F. Rodacki

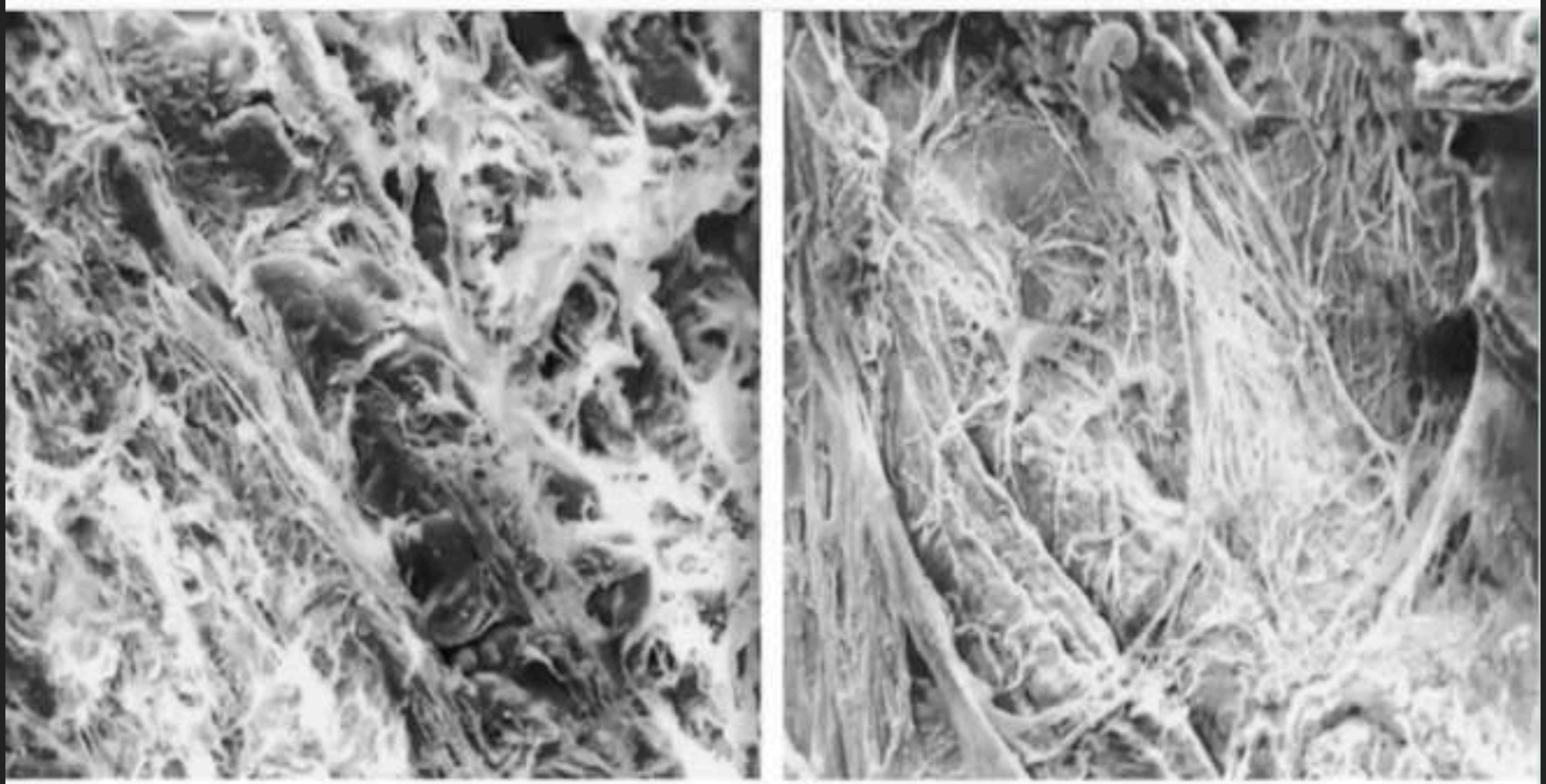
Published Online: 1 Oct 2016 | https://doi.org/10.1089/rej.2015.1764

Abstract

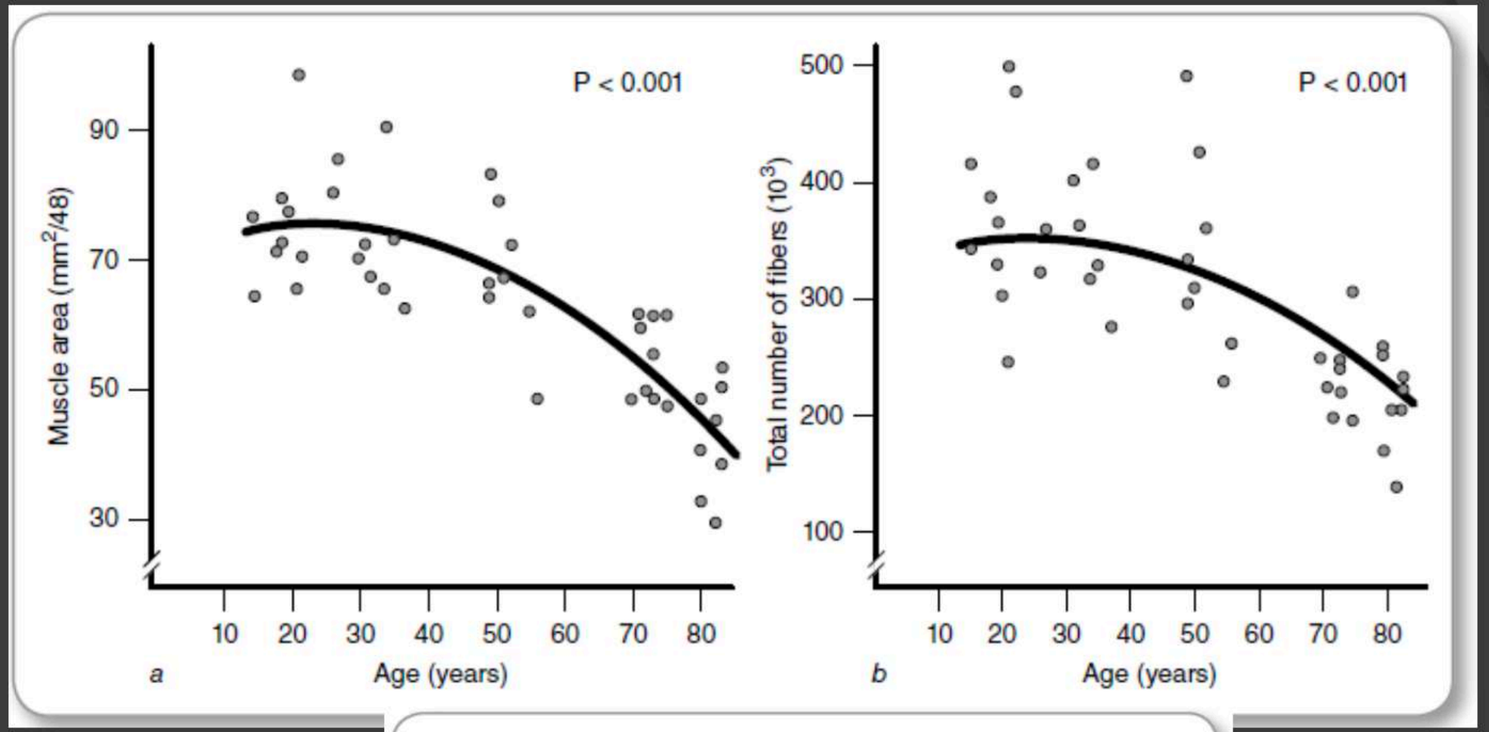
It has been proposed that muscle power is more effective to prevent falls than muscle force production capacity, as rapid reactions are required to allow the postural control. This study aimed to compare the effects of strength and power training on lower limb force, functional capacity, and static and dynamic balance in older female adults. Thirty-seven volunteered healthy women had been allocated into the strength-training group ($n = 14$; 69 ± 7.3 years, 155 ± 5.6 cm, 72 ± 9.7 kg), the power-training group ($n = 12$; 67 ± 7.4 years, 153 ± 5.5 cm, 67.2 ± 7 kg), and control group ($n = 11$; 65 ± 3.1 years, 154 ± 5.6 cm, 70.9 ± 3 kg). After 12 weeks of training, the strength-training and power-training groups increased significantly maximum dynamic strength (29% and 27%), isometric strength (26% and 37%), and step total time (13% and 14%, dynamic balance), respectively. However, only the power-training group increased the rate of torque development (55%) and the functional capacity in 30-second chair stand (22%) and in time up and go tests (–10%). Empirically, power training may reduce the risk of injuries due to lower loads compared to strength training, and consequently, the physical effort demand during the training session is lower. Therefore, power training should be recommended as attractive training stimuli to improve lower limb force, functional capacity, and postural control of older female adults.

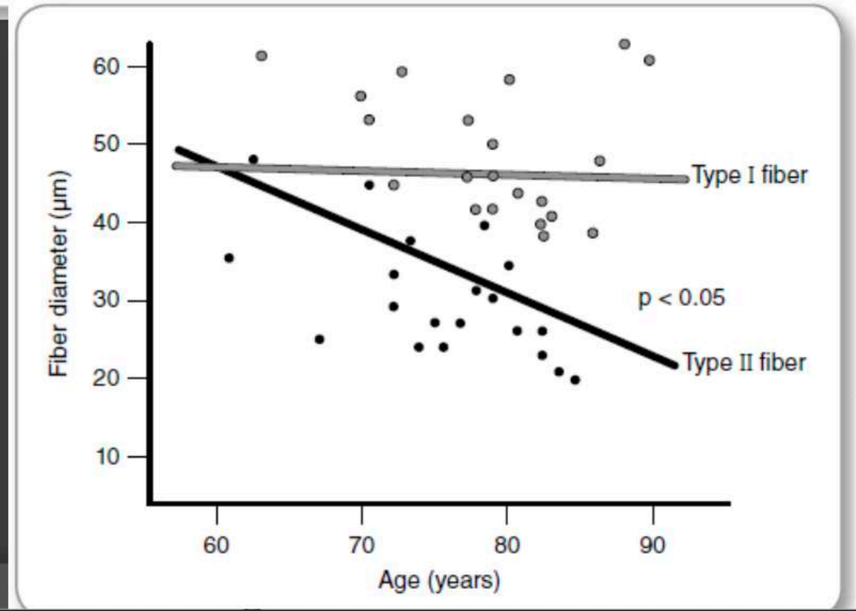
CONNECTIVE TISSUE CURVES




A
A: Free
B
B: immobilized (Järvinen 2002)

THE NEUROMUSCULAR CURVES

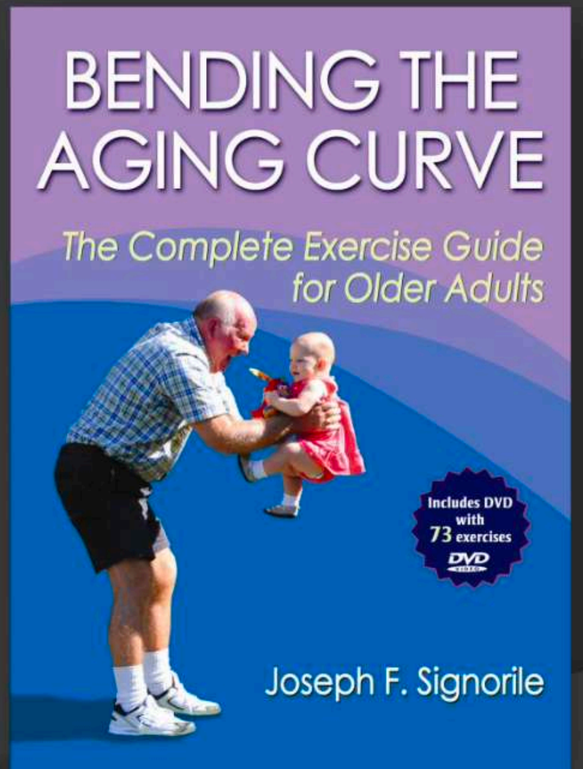




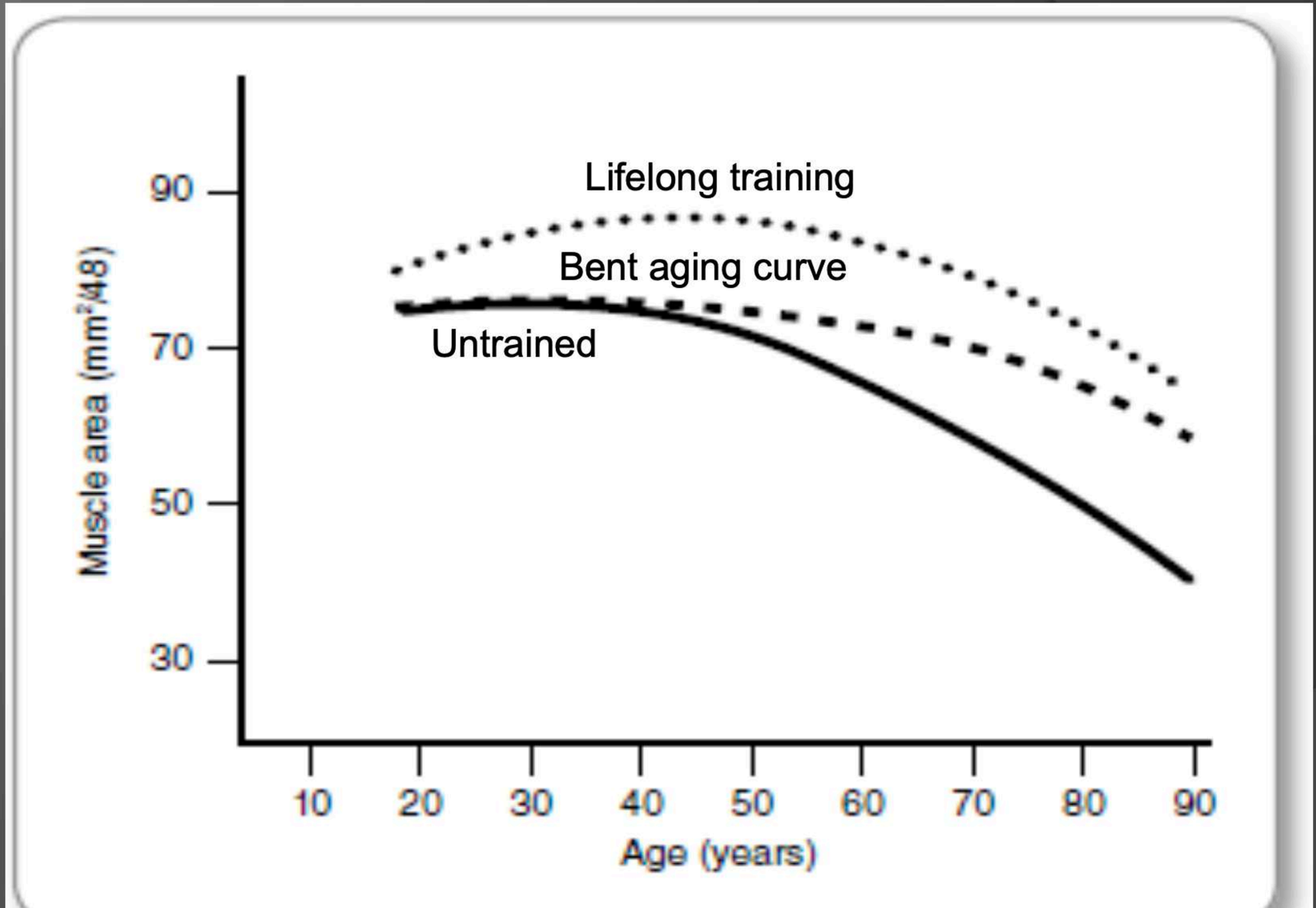
BENDING THE AGING CURVE:

A periodized prescription for improved aging

Joseph Signorile, PhD



BENDING THE AGING CURVE




This is how you do retirement
How will you move at age 68?

Comparison of Cardiorespiratory and Metabolic Responses in Kettlebell High-Intensity Interval Training Versus Sprint Interval Cycling

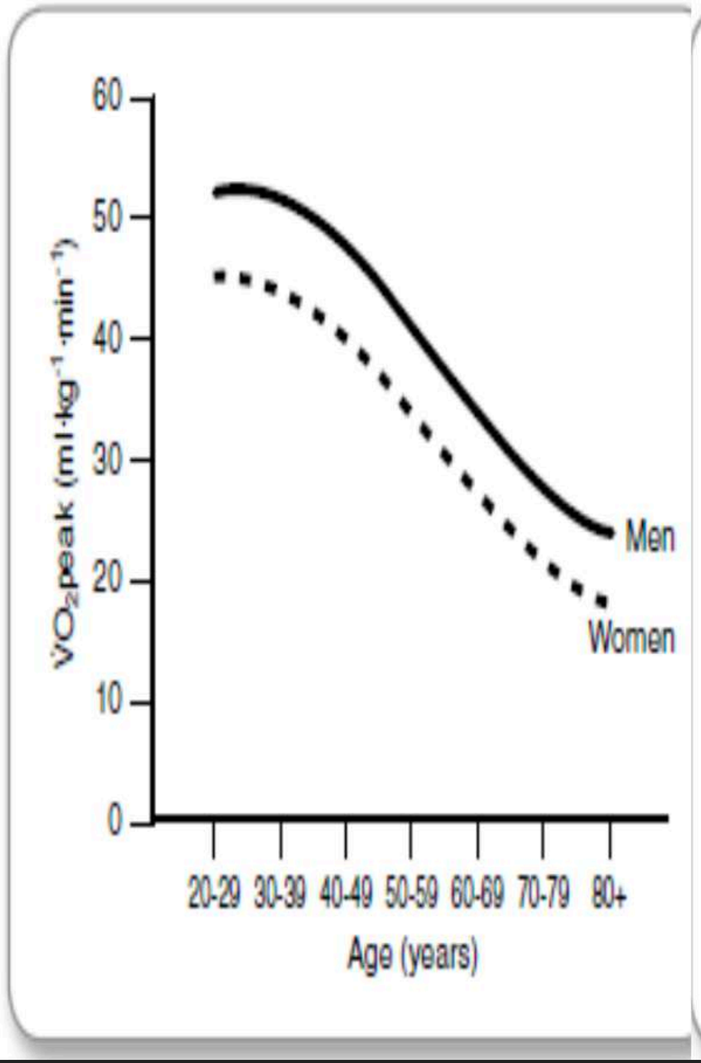
Williams, Brian M.; Kraemer, Robert R.

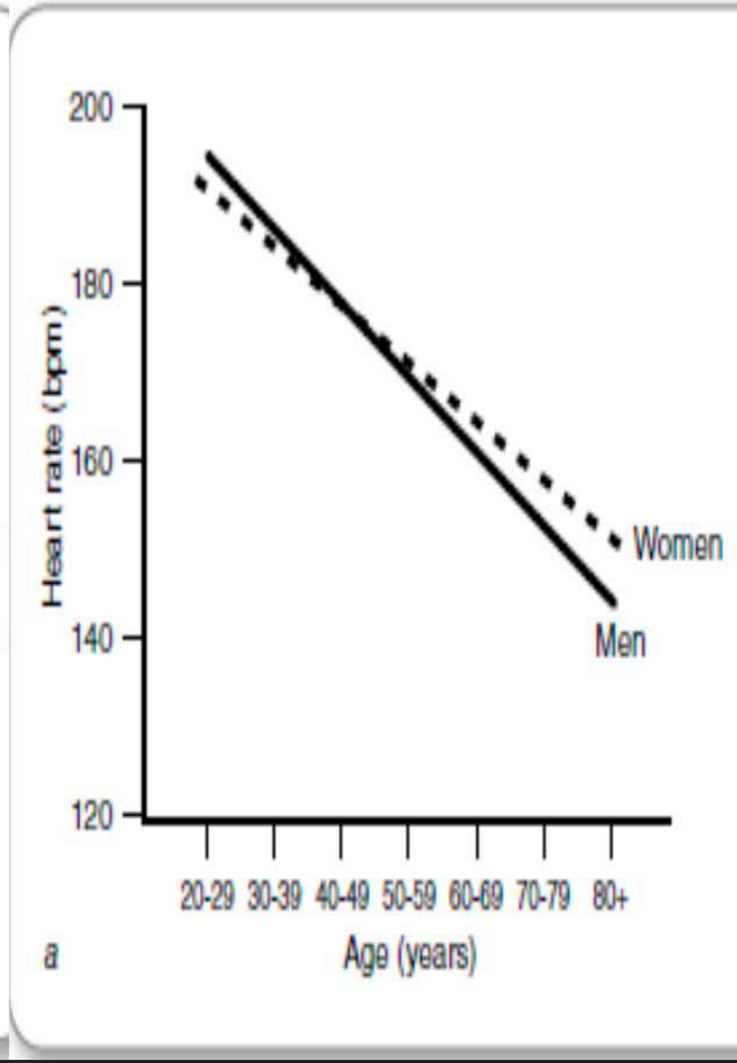
Author Information

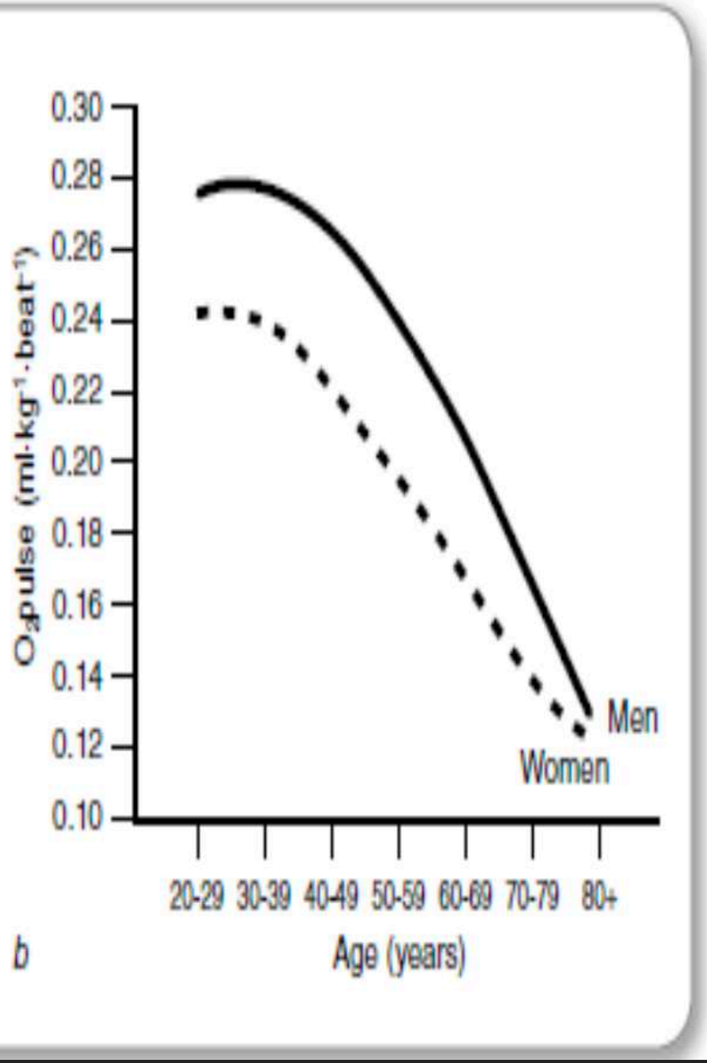
Journal of Strength and Conditioning Research: December 2015 - Volume 29 - Issue 12 - p 3317-3325
doi: 10.1519/JSC.0000000000001193

Williams, BM and Kraemer, RR. Comparison of cardiorespiratory and metabolic responses in kettlebell high-intensity interval training versus sprint interval cycling. *J Strength Cond Res* 29(12): 3317–3325, 2015—The purpose of this study was to determine the effectiveness of a novel exercise protocol we developed for kettlebell high-intensity interval training (KB-HIIT) by comparing the cardiorespiratory and metabolic responses to a standard sprint interval cycling (SIC) exercise protocol. Eight men volunteered for the study and completed 2 preliminary sessions, followed by two 12-minute sessions of KB-HIIT and SIC in a counterbalanced fashion. In the KB-HITT session, 3 circuits of 4 exercises were performed using a Tabata regimen. In the SIC session, three 30-second sprints were performed, with 4 minutes of recovery in between the first 2 sprints and 2.5 minutes of recovery after the last sprint. A within-subjects' design over multiple time points was used to compare oxygen consumption (V[Combining Dot Above]O_2), respiratory exchange ratio (RER), tidal volume (TV), breathing frequency (f), minute ventilation (V_E), caloric expenditure rate (kcal·min^{-1}), and heart rate (HR) between the exercise protocols. Additionally, total caloric expenditure was compared. A significant group effect, time effect, and group × time interaction were found for V[Combining Dot Above]O_2, RER, and TV, with V[Combining Dot Above]O_2 being higher and TV and RER being lower in the KB-HIIT compared with the SIC. Only a significant time effect and group × time interaction were found for f, V_E, kcal·min^{-1}, and HR. Additionally, total caloric expenditure was found to be significantly higher during the KB-HIIT. The results of this study suggest that KB-HIIT may be more attractive and sustainable than SIC and can be effective in stimulating cardiorespiratory and metabolic responses that could improve health and aerobic performance.

CARDIOVASCULAR CURVES







Effect of an Acute Bout of Kettlebell Exercise on Glucose Tolerance in Sedentary Men: A Preliminary Study

SAMANTHA GREENWALD[†1], EDWARD SEGER[†1], DAVID NICHOLS[*1], ANDREW D. RAY[‡2], TODD C. RIDEOUT[‡1], and LUC E. GOSSELIN[‡1]

[1] Exercise and Nutrition Sciences, University at Buffalo, Buffalo, NY, USA;
[2] Rehabilitation Sciences, University at Buffalo, Buffalo, NY, USA

ABSTRACT

International Journal of Exercise Science 9(4): 524-535, 2016. Impaired glucose tolerance can have significant health consequences. The purposes of this preliminary study were to examine whether a single session of kettlebell exercise improves acute post-exercise glucose tolerance in sedentary individuals, and whether it was as effective as high-intensity interval running. Six sedentary male subjects underwent a two-hour oral glucose tolerance test following three different conditions: 1) control (no exercise); 2) kettlebell exercise (2 sets of 7 exercises, 15 repetitions per exercise with 30 seconds rest between each exercise); or 3) high-intensity interval running (10 one-minute intervals at a workload corresponding to 90% VO_2max interspersed with one-minute active recovery periods). Blood glucose and insulin levels were measured before (0 minutes), and 60 and 120 minutes after glucose ingestion. Both kettlebell and high-intensity interval running exercise significantly lowered blood glucose 60 minutes after glucose ingestion compared with control. However, there was no significant difference in blood glucose between the two exercise conditions at any time point. In addition, there were no significant differences in insulin concentration between high intensity interval running, kettlebell, and control conditions at all time points. Results indicate that an acute bout of kettlebell exercise is as effective as high intensity interval running at improving glucose tolerance in sedentary young men.

Acute Cardiorespiratory and Metabolic Effects of a Sandbag Resistance Exercise Protocol

Nicholas A. Ratamess, Jie Kang, Jeremy D. Kuper, Elizabeth A. O'Grady, Nicole L. Ellis, Ira T. Vought, Emma Culleton, Jill A. Bush, and Avery D. Faigenbaum

Department of Health and Exercise Science, The College of New Jersey, Ewing, New Jersey

Table 4. Ratings of perceived exertion during the SB protocol.*

	Set 1	Set 2	Set 3	Mean
Front squat	5.75 ± 1.7	7.88 ± 1.2†	8.38 ± 1.2†‡	7.33 ± 1.0
Clean	6.00 ± 1.4	7.50 ± 1.2§	8.75 ± 1.4†‡	7.42 ± 1.1
Bear hug squat	7.00 ± 1.5	8.38 ± 1.2	9.38 ± 1.1†‡	8.25 ± 1.0¶
Rotational DL	7.00 ± 1.2	8.25 ± 1.1†	9.38 ± 0.7†‡	8.21 ± 0.9¶
Lunge with rotation	6.71 ± 1.0	8.13 ± 1.0†	9.13 ± 1.1†‖	8.06 ± 0.8
Lateral drag	6.38 ± 1.1	7.88 ± 1.1†	9.00 ± 1.1†‡	7.75 ± 0.9
OH press	6.88 ± 1.1	8.25 ± 1.2†	9.13 ± 1.0†‡	8.08 ± 1.0¶
Shouldering	7.13 ± 1.0	8.50 ± 1.3†	9.25 ± 1.0†‡	8.29 ± 1.0¶

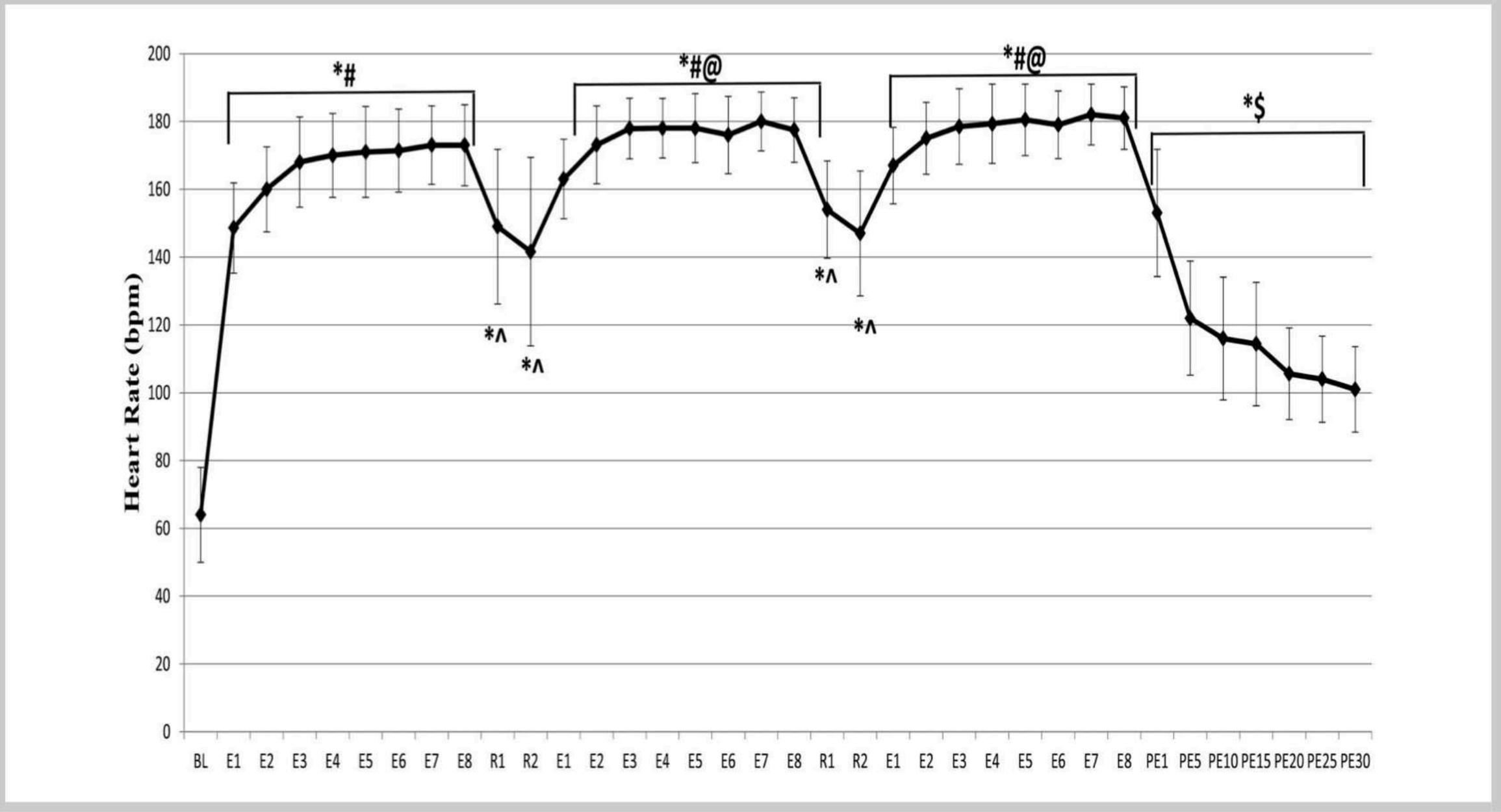


Figure 4. Heart rate (HR) responses during the SB protocol. E = exercise number; R1 = first minute of rest after set; R2 = second minute of rest after set; PE = postexercise; *$p \leq 0.05$ from baseline (BL); #$p \leq 0.05$ from E1 to E8; @$p \leq 0.05$ compared with all exercises in set 1; ^$p \leq 0.05$ compared with all exercise values; \$$p \leq 0.05$ from PE1 to PE30.

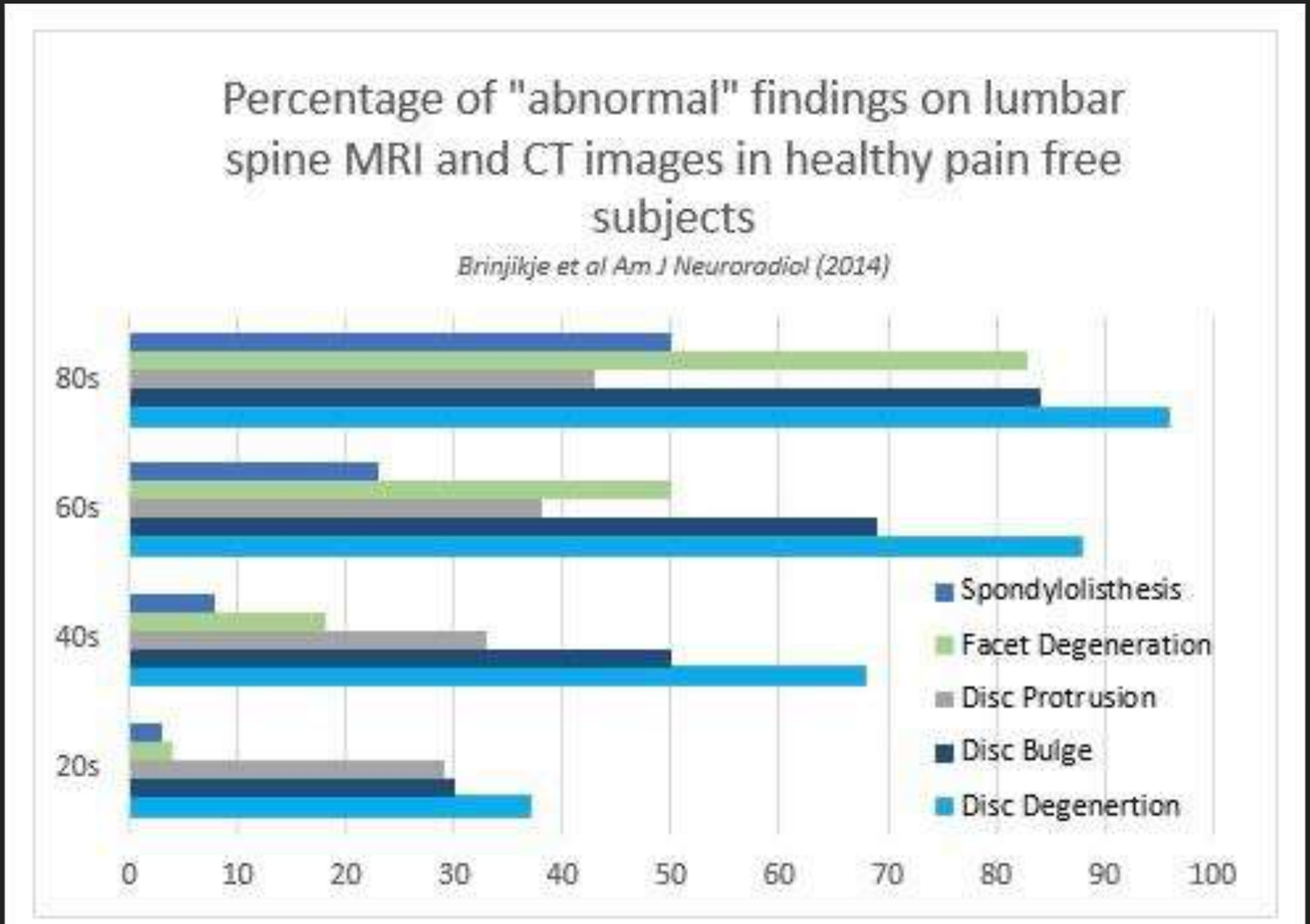
Heart Rate

Heart rate values were significantly elevated during all exercise and PE trials ($p < 0.001$; $\eta^2 = 0.97$). Compared with CT (65.9 ± 14.0 b·min^{-1}), mean exercise HR values were significantly higher during the SB (169.7 ± 11.2 b·min^{-1}), 60$\dot{V}O_2$R (151.8 ± 9.8 b·min^{-1}), and 80$\dot{V}O_2$R (170.5 ± 13.5 b·min^{-1}) protocols. No significant differences were observed between SB and 80$\dot{V}O_2$R, although both protocols yielded significantly higher HR values than 60$\dot{V}O_2$R. Similar results were observed for peak HR (SB = 183.0 ± 8.7 b·min^{-1}; 60$\dot{V}O_2$R = 160.4 ± 11.8 b·min^{-1}; and 80$\dot{V}O_2$R = 177.4 ± 14.4 b·min^{-1}). Mean HR during the 30-minute PE period in SB (116.7 ± 14.1 b·min^{-1}) was significantly higher than 60$\dot{V}O_2$R (87.6 ± 13.1 b·min^{-1}) and 80$\dot{V}O_2$R (101.5 ± 9.5 b·min^{-1}) and mean HR in 80$\dot{V}O_2$R was significantly higher than 60$\dot{V}O_2$R.

Most Effective Methods of Resistance Training

High-speed explosive training using 60%1RM can burn more calories than the low-speed or 80%1RM high-speed explosive conditions and effectively improve ADL performance and reduce fall probability in persons with sarcopenic obesity; therefore, high-speed, moderate-resistance training cycles appear to be the “two-for-one” special on your training menu.

UNDERSTANDING CLIENT HEALTH RISKS



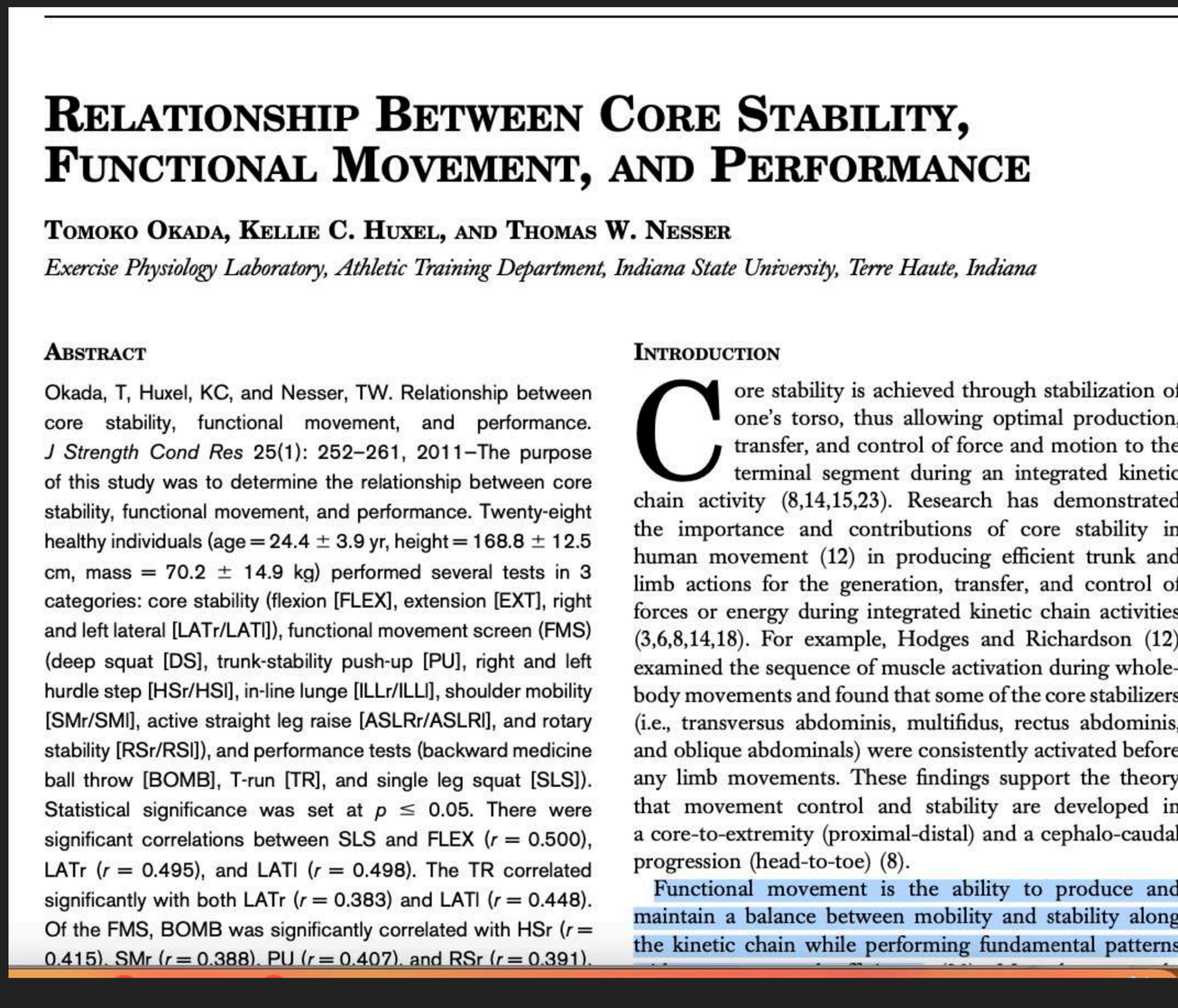

Rx
DATE
PATIENT NAME
ADDRESS
Prescription:
exercise

THE JOSH MISTAKES

- Introduced speed movement too early: speed increases stability demands.
- Went too heavy too soon: internal coordination of muscles is hard to view
- Didn’t build enough movement proficiency is a variety of environments: had low movement vocabulary
- Didn’t develop deceleration enough: most injuries occur during deceleration

HOW WE MAKE POWER MORE FUNCTIONAL

"Functional movement is the ability to produce and maintain a balance between mobility and stability along the kinetic chain while performing fundamental patterns with accuracy and efficiency ."



Relationship Between Core Stability, Functional Movement, and Performance

Tomoko Okada, Kellie C. Huxel, and Thomas W. Nesser

Exercise Physiology Laboratory, Athletic Training Department, Indiana State University, Terre Haute, Indiana

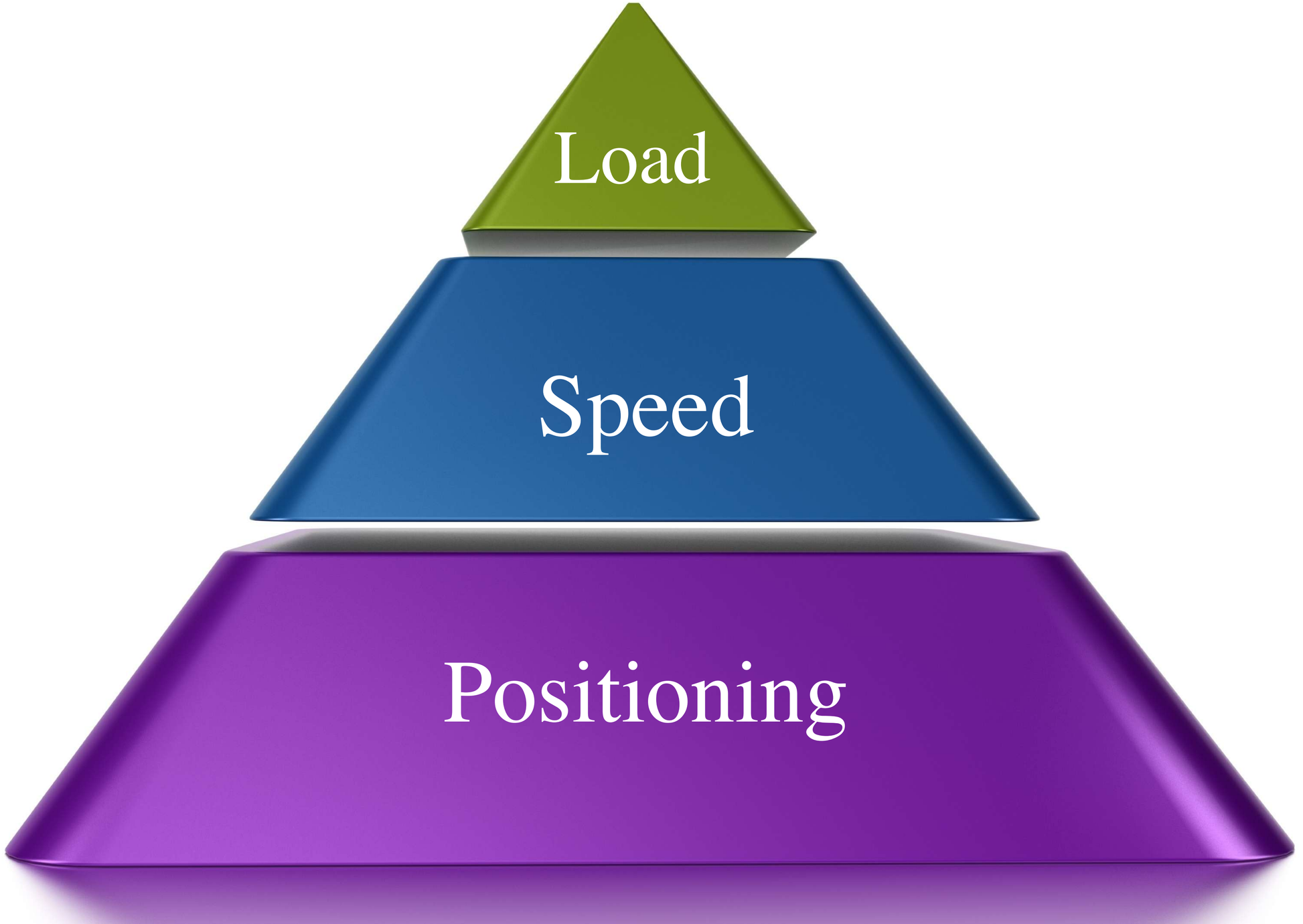
Abstract

Okada, T, Huxel, KC, and Nesser, TW. Relationship between core stability, functional movement, and performance. *J Strength Cond Res* 25(1): 252–261, 2011—The purpose of this study was to determine the relationship between core stability, functional movement, and performance. Twenty-eight healthy individuals (age = 24.4 ± 3.9 yr, height = 168.8 ± 12.5 cm, mass = 70.2 ± 14.9 kg) performed several tests in 3 categories: core stability (flexion [FLEX], extension [EXT], right and left lateral [LATr/LATl]), functional movement screen (FMS) (deep squat [DS], trunk-stability push-up [PU], right and left hurdle step [HSr/HSl], in-line lunge [ILLr/ILLl], shoulder mobility [SMr/SMl], active straight leg raise [ASLRr/ASLRl], and rotary stability [RSr/RSl]), and performance tests (backward medicine ball throw [BOMB], T-run [TR], and single leg squat [SLS]). Statistical significance was set at $p \leq 0.05$. There were significant correlations between SLS and FLEX ($r = 0.500$), LATr ($r = 0.495$), and LATl ($r = 0.498$). The TR correlated significantly with both LATr ($r = 0.383$) and LATl ($r = 0.448$). Of the FMS, BOMB was significantly correlated with HSr ($r =$ 0.415), SMr ($r = 0.388$), PU ($r = 0.407$), and RSr ($r = 0.391$).

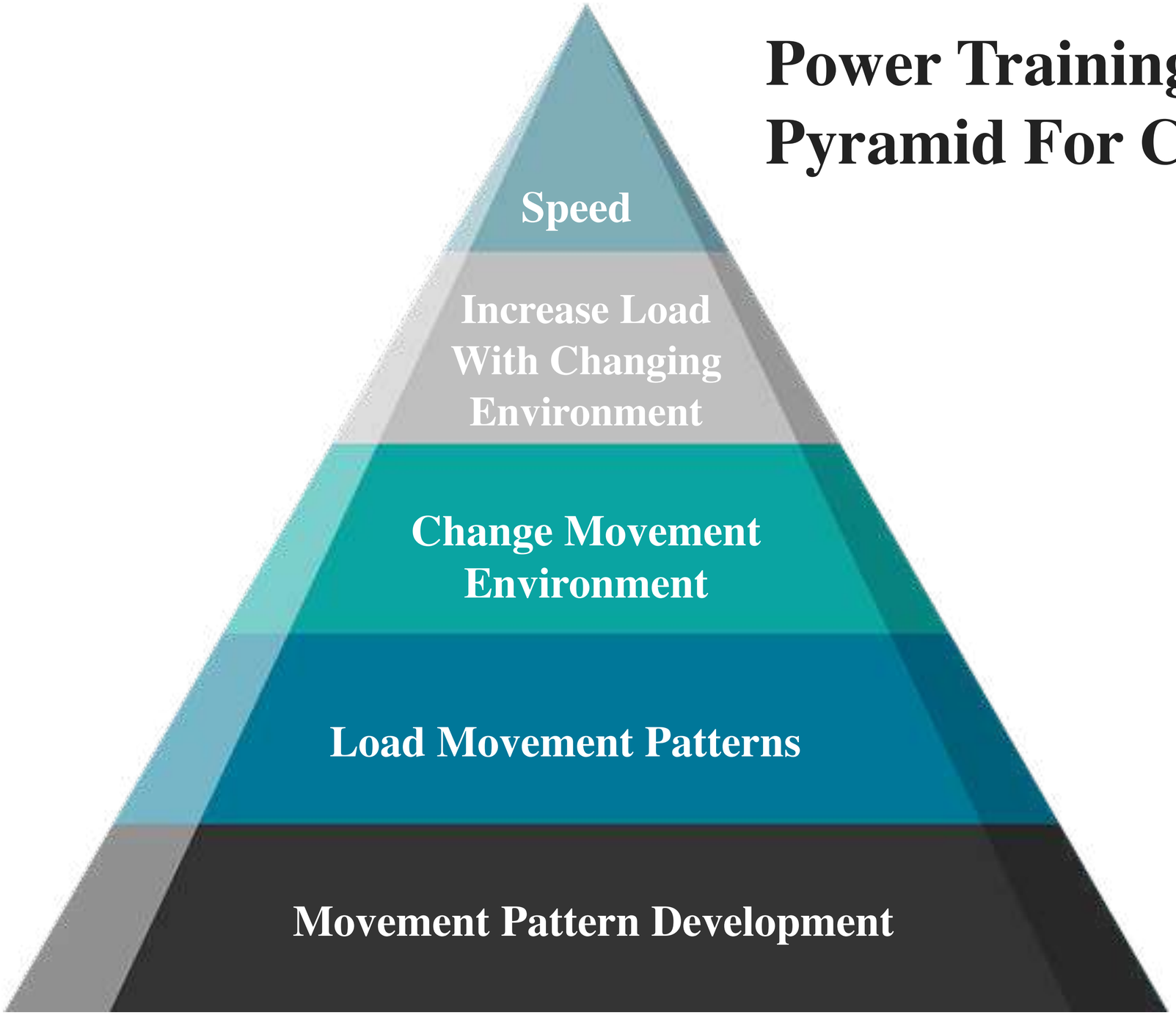
Introduction

Core stability is achieved through stabilization of one's torso, thus allowing optimal production, transfer, and control of force and motion to the terminal segment during an integrated kinetic chain activity (8,14,15,23). Research has demonstrated the importance and contributions of core stability in human movement (12) in producing efficient trunk and limb actions for the generation, transfer, and control of forces or energy during integrated kinetic chain activities (3,6,8,14,18). For example, Hodges and Richardson (12) examined the sequence of muscle activation during whole-body movements and found that some of the core stabilizers (i.e., transversus abdominis, multifidus, rectus abdominis, and oblique abdominals) were consistently activated before any limb movements. These findings support the theory that movement control and stability are developed in a core-to-extremity (proximal-distal) and a cephalo-caudal progression (head-to-toe) (8).

Functional movement is the ability to produce and maintain a balance between mobility and stability along the kinetic chain while performing fundamental patterns


Load
Speed
Positioning

Power Training Pyramid For Clients




THINGS THAT MAKE YOU GO
HMMM...
© Social Mare Media
imgflip.com

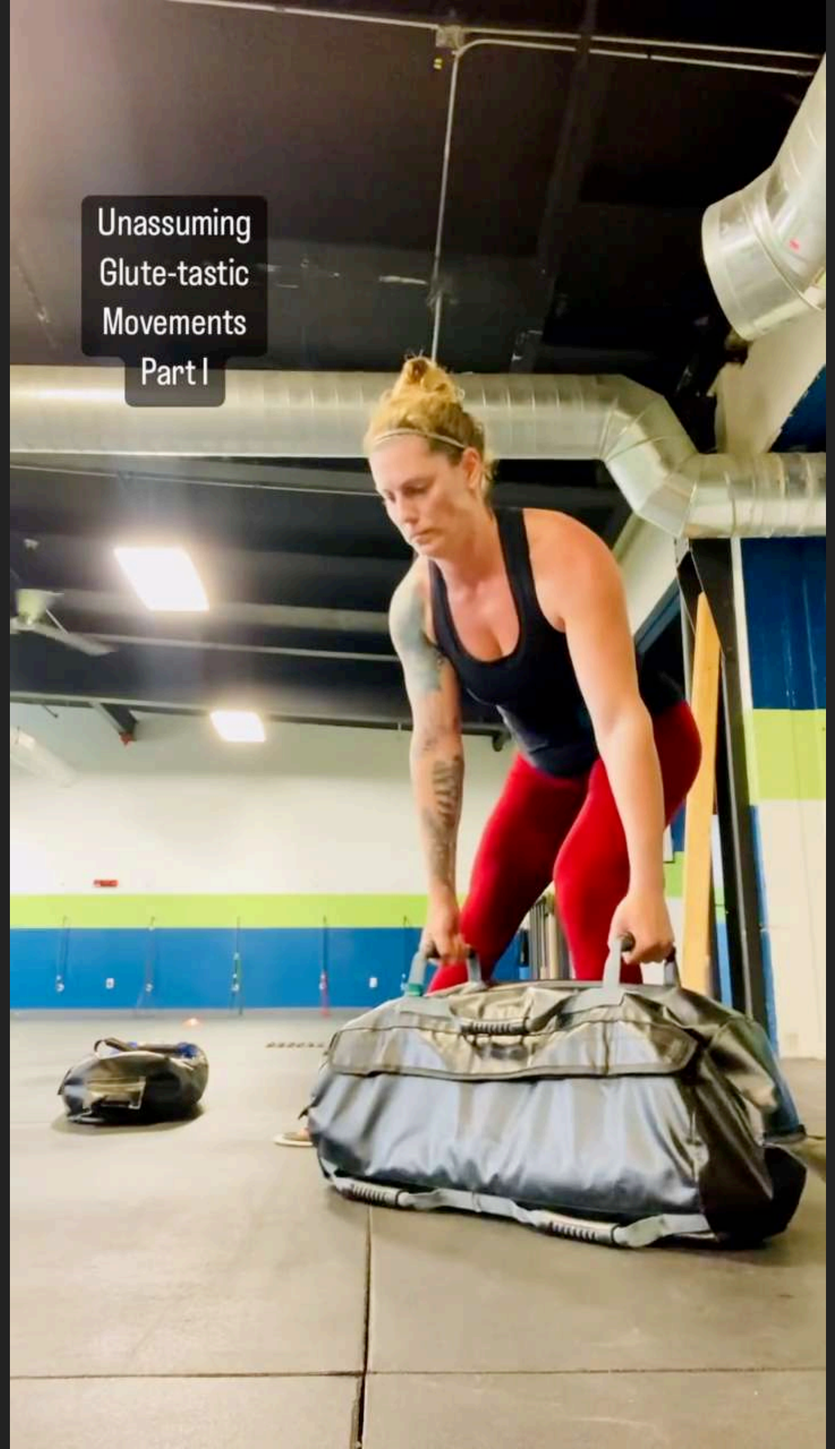
WHAT ABOUT JUMPS?!

- The emotional stress of jumping (guarding)
- Landing is actually more important
- The training background and health history of the client is essential
- Needs of the client
- Proper progressions

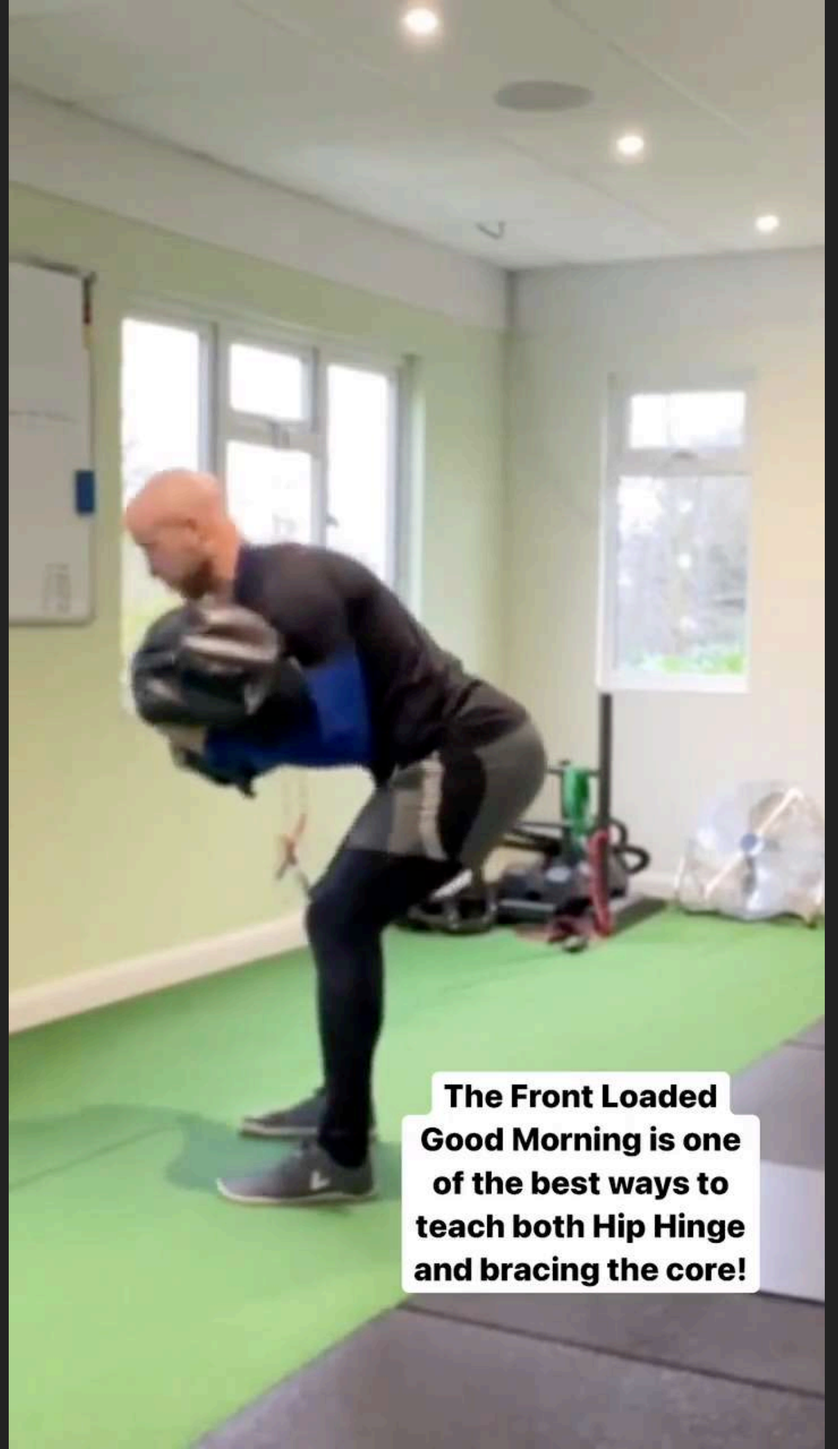

reps
joelgun10


RUNNER'S
Get Fit Now!
SEXY BODY
SANDBAG TRAINING


TEAM
YUDIN
TRAINING
18"
ROGUE


Unassuming
Glute-tastic
Movements
Part I


Kettlebell swings are great power exercises!


The Front Loaded Good Morning is one of the best ways to teach both Hip Hinge and bracing the core!


pepsi

Primal Movement Patterns

1 Hip Hinge

2 SQUAT

3 LUNGE

4 PUSH

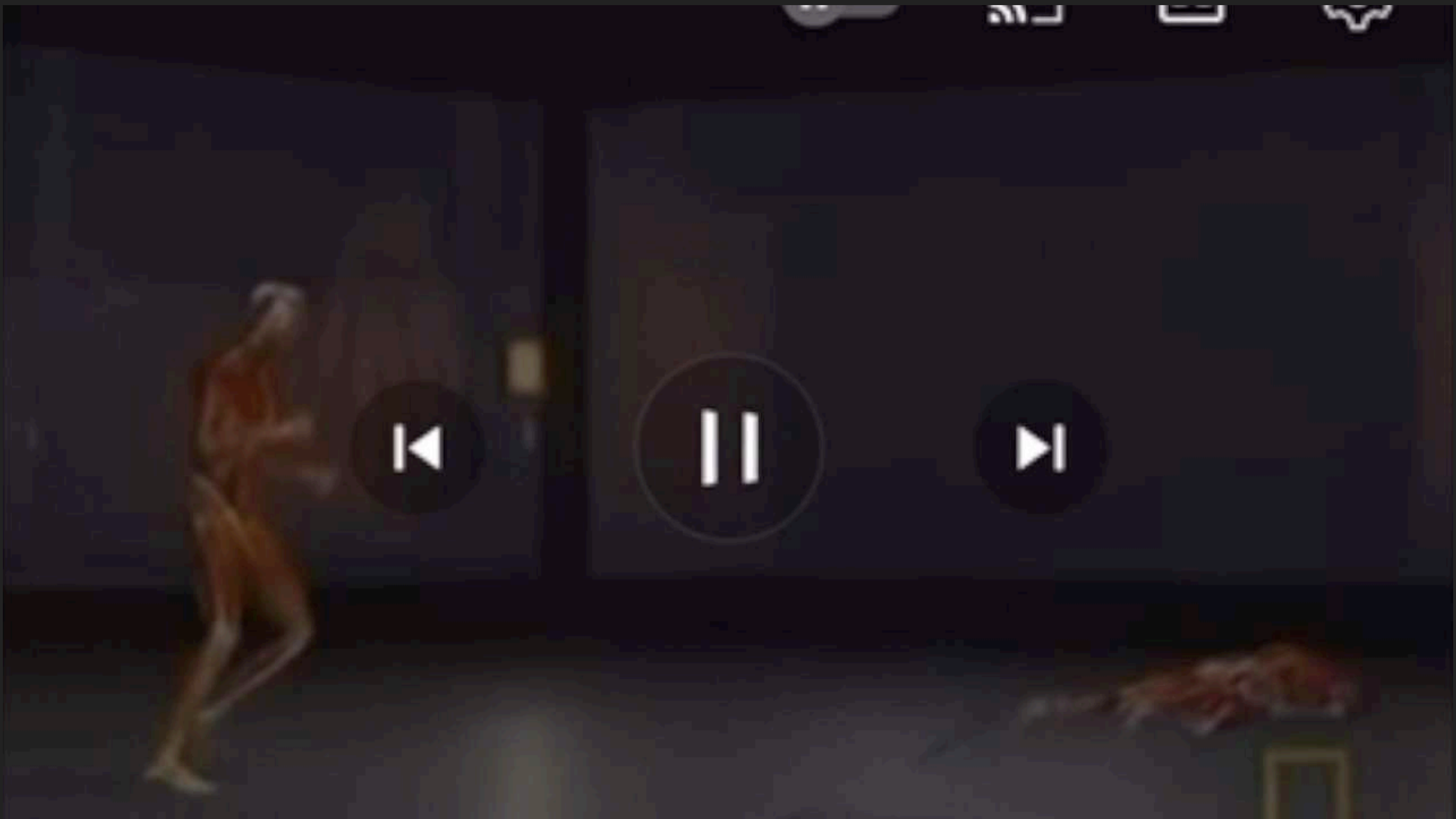
5 PULL

6 ROTATION

7 LOCOMOTION


NOPE!


ZONE
ALLOW YOURSELF TO BE CHALLENGED
A journey of a
thousand miles
begins with a
single step



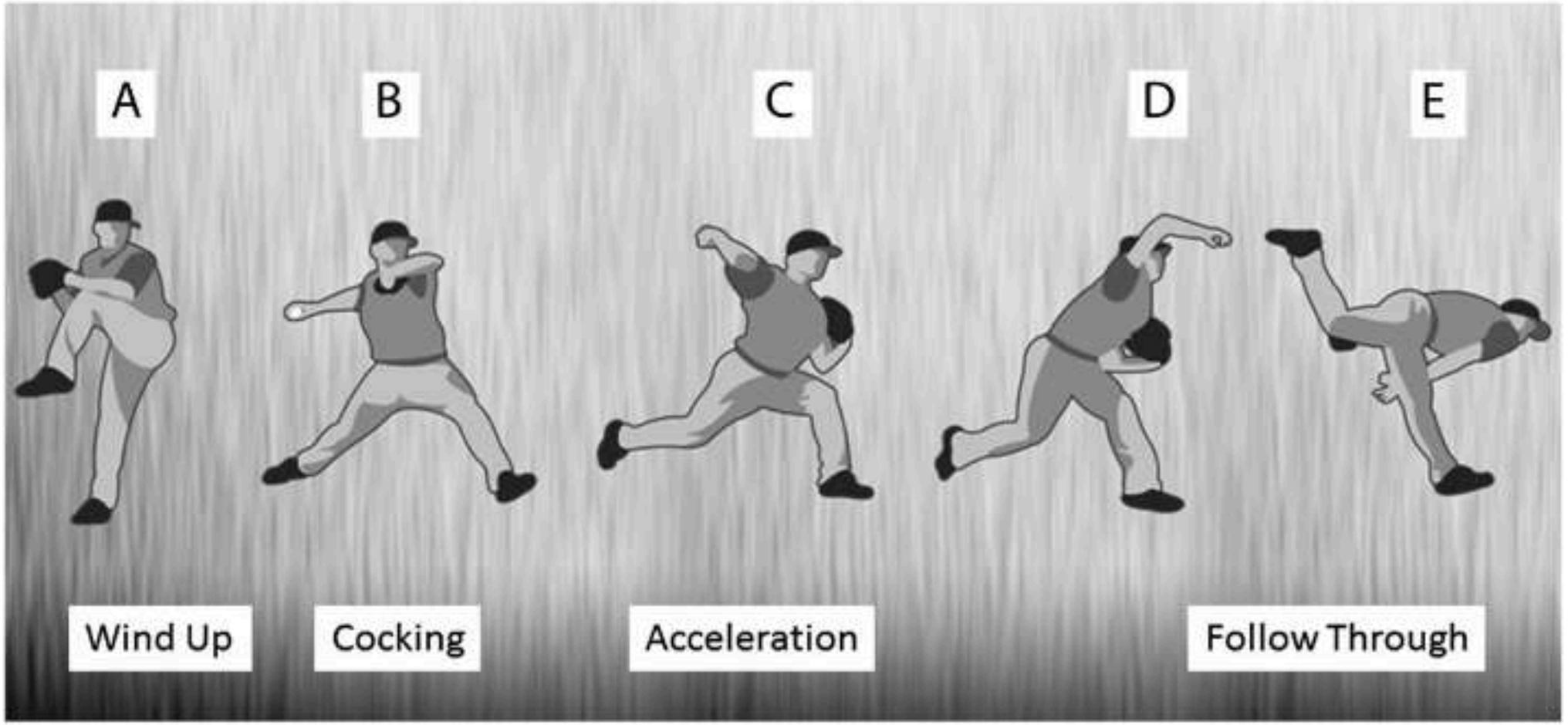
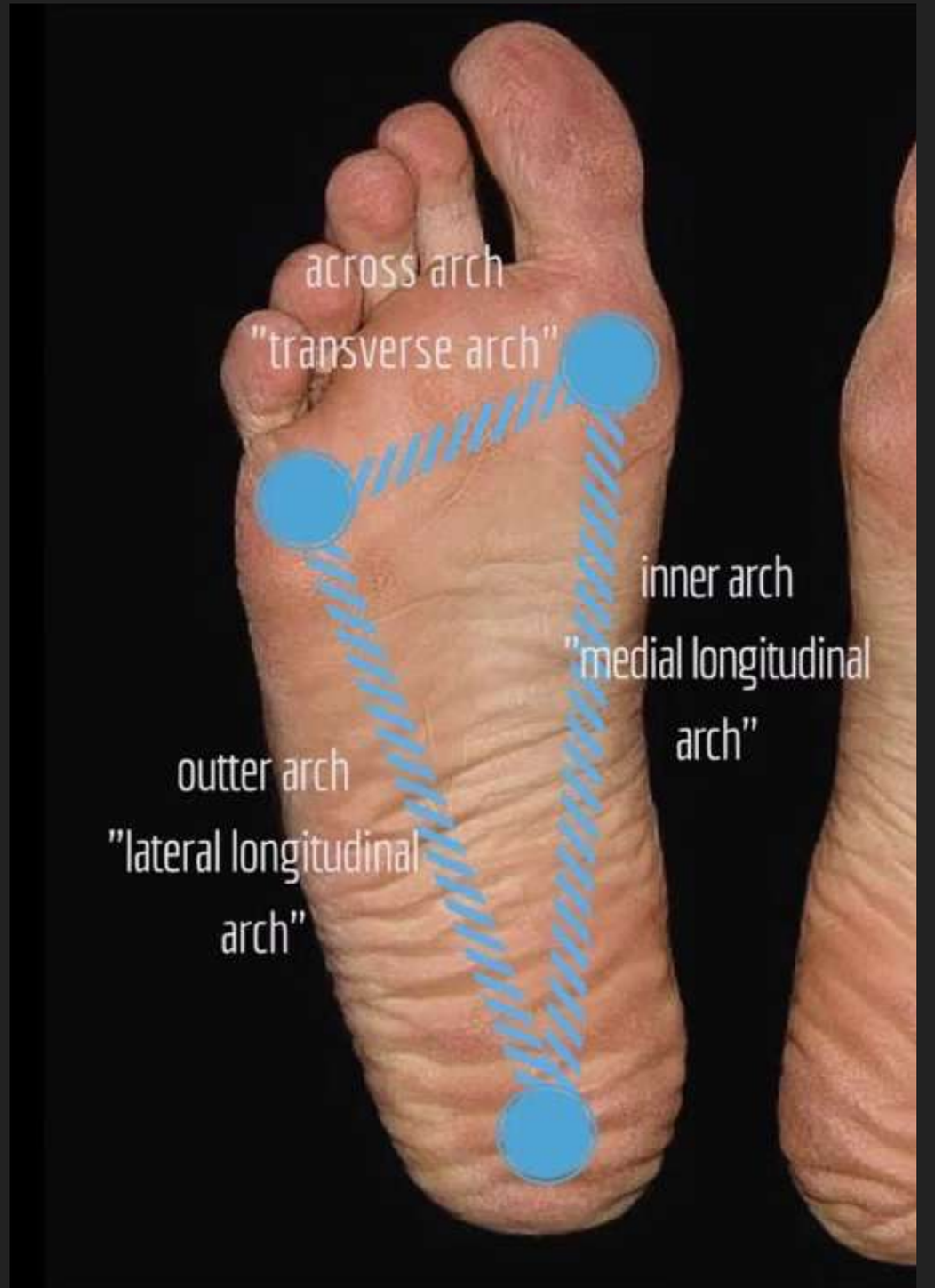
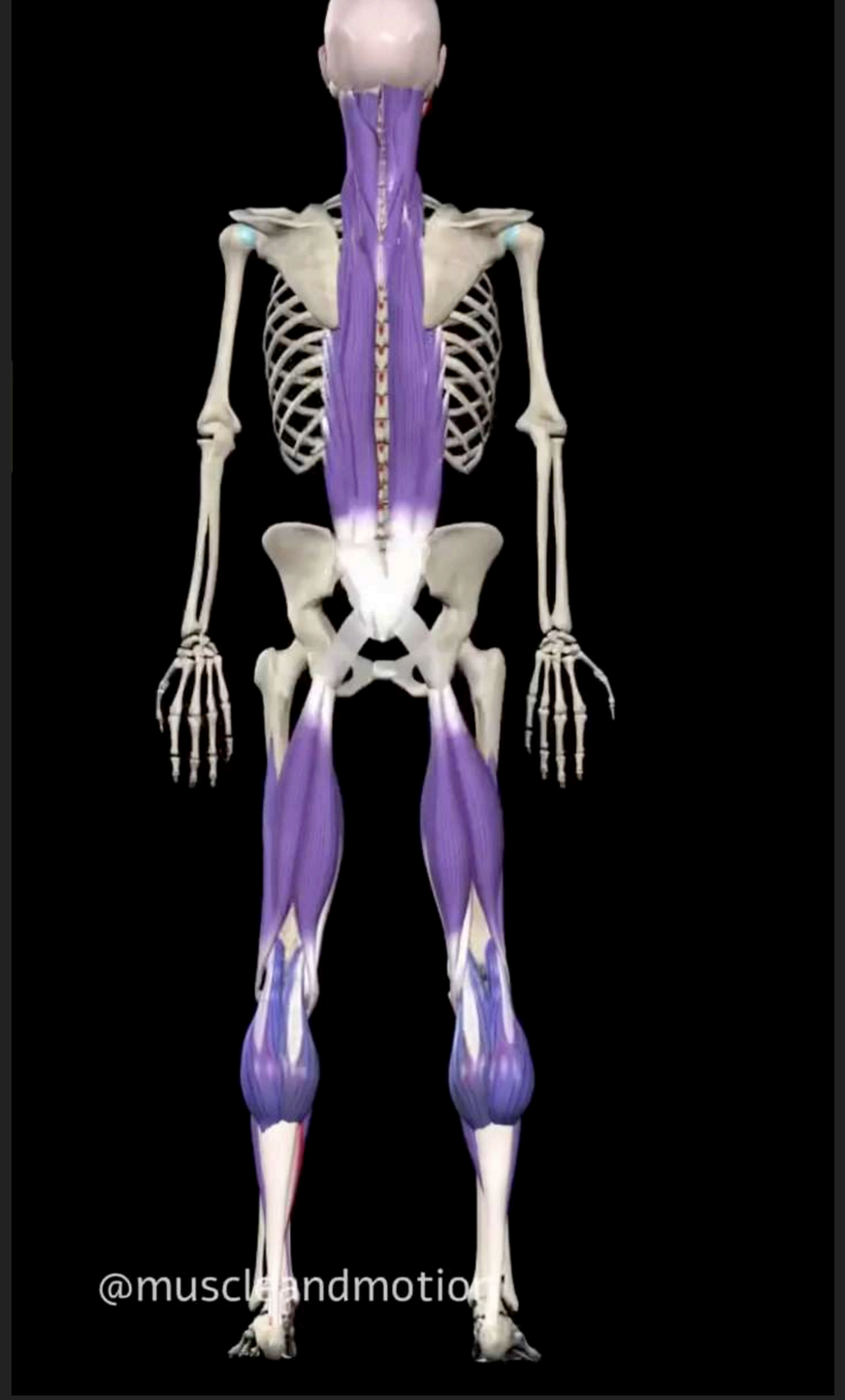
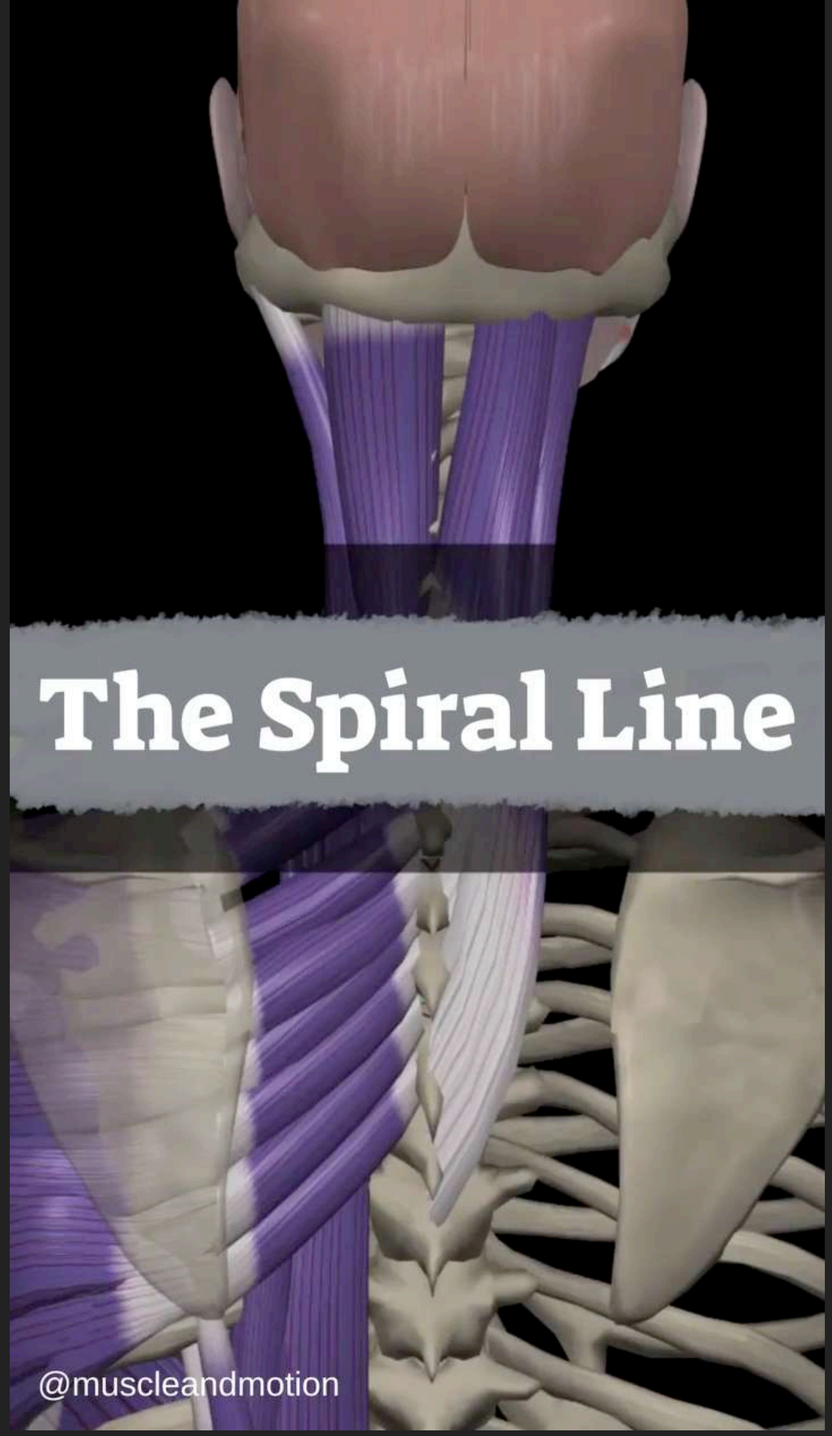
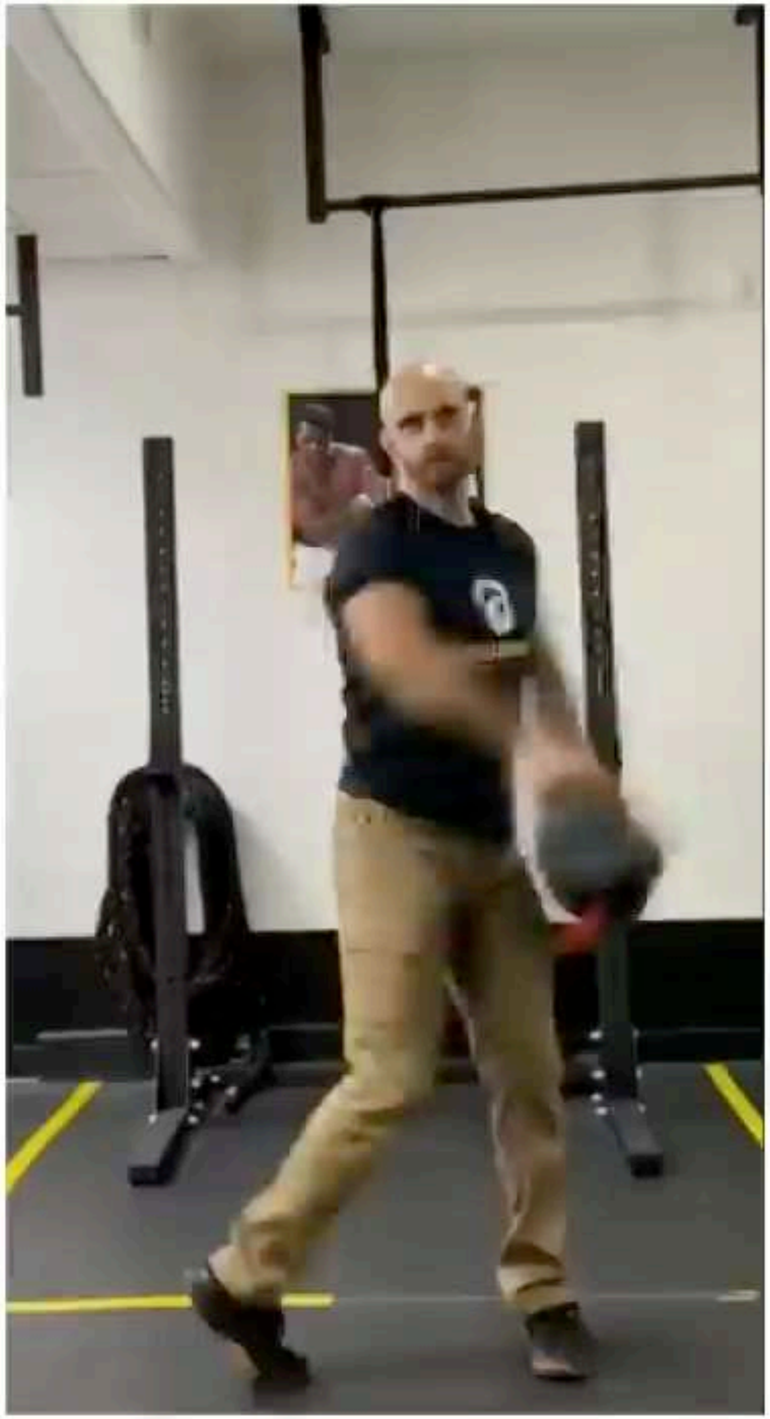


Figure 1. Notice that there is little "twisting" of the core during the entire pitching motion beginning at wind up; the core is actually "stiffened" during the cocking and acceleration phases. This stiffening allows the serape muscle and other tissues to transfer the serape's "hip power" to the shoulders and eventually the hand all the way to the follow through.

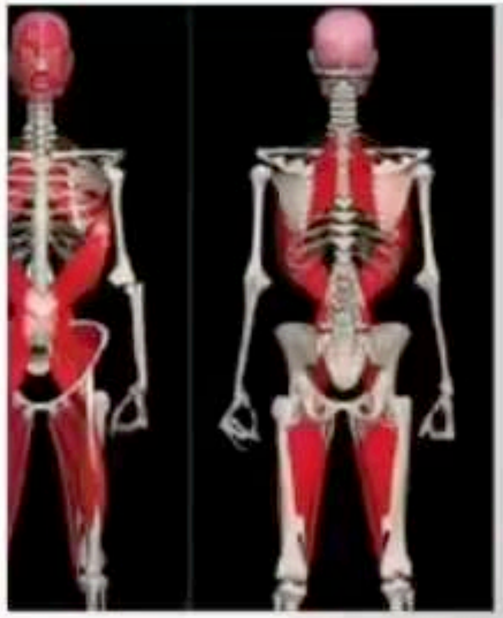

across arch
"transverse arch"
inner arch
"medial longitudinal
arch"
outter arch
"lateral longitudinal
arch"


@muscleandmotion


The Spiral Line
@muscleandmotion




External
Obliques
Adductor
complex



ANTERIOR SERA

- Right Hip Flexo
- Right Adductor
- Right Internal C
- Left External Ob
- Left Serratus An
- Left Rhomboid
- Right Rhomboi
- Right Serratus A
- Right External C
- Left Internal Ob
- Left Adductors
- Left Hip Flexors

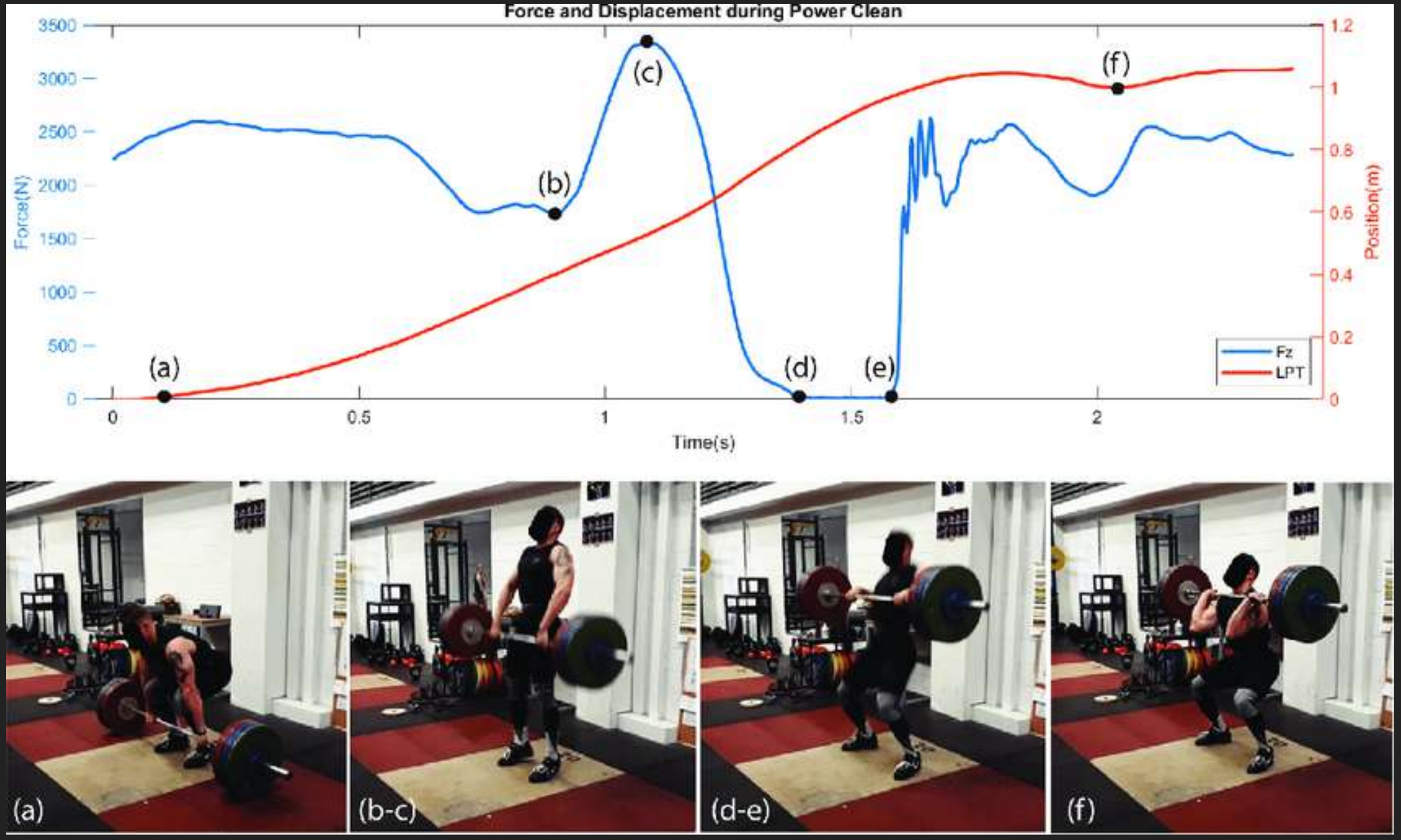
POSTERIOR SERAPI

POSTERIOR SI

- Right Gastro
- Right Hamst
- Right glutes
- Left Latissim
- Left Pectoral
- Right Pector
- Right Latissi
- Left Glutes
- Left Hamstri
- Left Gastroc,

HOW DID WE GET HERE?

- According to Newton's third law the so-called ground reaction force (GRF) is the force exerted by the ground on a body in contact with it. When a person is just standing, the GRF corresponds with the person's weight. When the body is moving, the GRF increases due to acceleration forces.


Force and Displacement during Power Clean
Force(N)
Position(m)
Time(s)
(a)
(b)
(c)
(d)
(e)
(f)
Fz
LPT
(a)
(b-c)
(d-e)
(f)


make you TIRED,
can make you BETTER!

- Foot Stability
- Multi-Planar Hip Training
- Acceleration and Deceleration Training From Single Leg
- Can Be Progressed In Multiple Ways…
- Height Of Step
- Direction Of Step
- Loading In Various Positions

Classification	Level of activation	Exercise	Average (%MVIC)
1º	Very high	Step-Up	169.22 ± 101.47
2°	Very high	Lateral Step-Up	114.25 ± 54.74
3°	Very high	Diagonal Step-Up	113.21 ± 43.54
4°	Very high	Crossover Step-up	104.19 ± 33.63
5°	Very high	Hex Bar Deadlift	88 ± 16
6°	Very high	Rotation Barbell Hip Thrust	86.18 ± 34.3
7°	Very high	Traditional Barbell Hip Thrust	82.37 ± 18.65 (Lower GM: 69.5/Upper GM: 86.7)

Table 6. RMS EMG data for the gluteus medius (GMD) during the eccentric (ECC) and concentric (CON) phases of the 4 study exercises. (N=14)

	Step-Up	Lunge	Deadlift	Squat
GMD ECC	0.56 ± 0.27[a]	0.55 ± 0.30[a]	0.25 ± 0.09[b]	0.23 ± 0.11[b]
GMD CON	0.85 ± 0.27[a]	0.84 ± 0.35[a]	0.56 ± 0.34[b]	0.38 ± 0.15[b]

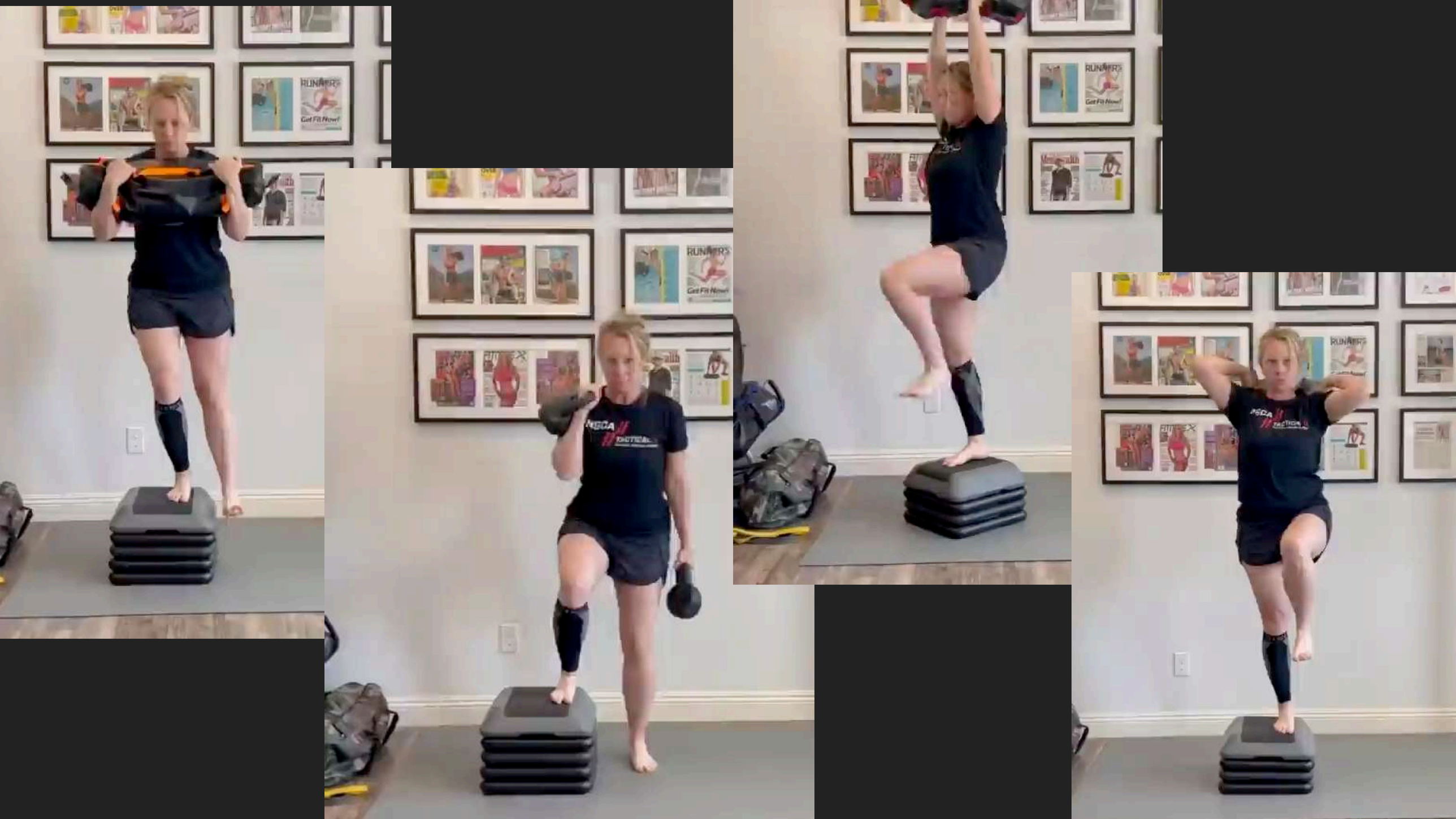
a = significantly different than S and DL ($p \leq 0.001$); b = significantly different than SU and L ($p \leq 0.001$)

Table 7. RMS EMG data for the gluteus maximus (GMX) during the eccentric (ECC) and concentric (CON) phases of the 4 study exercises. (N=14)

	Lunge	Step-Up	Deadlift	Squat
GMX ECC	0.95 ± 0.45[a]	0.87 ± 0.31	0.76 ± 0.36[b]	0.62 ± 0.34[b]
	Step Up	Lunge	Deadlift	Squat
GMX CON	1.99 ± 0.91[c]	1.88 ± 0.69[c]	1.79 ± 0.88[c]	1.18 ± 0.50[d]


mal Movement Patterns
2
3
4
5
6
7


Primal Movement Patterns
1
2
3
4
5
6
7


RUNNER'S
Get Fit Now!


Lateral Lunge

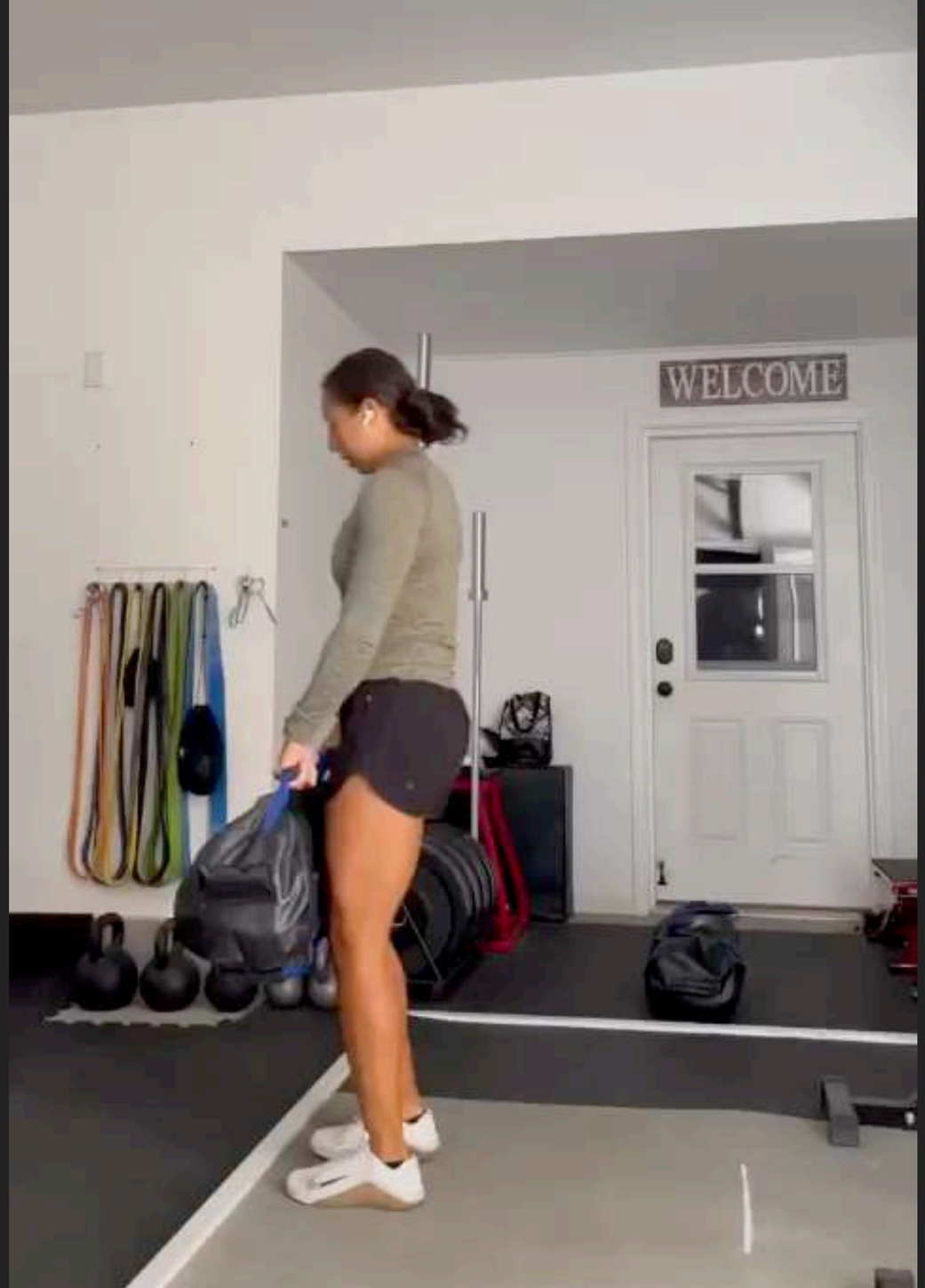

Lateral Squat


Get Fit Now!
INFINITY TRAINER


EQUINOX


XC getting after their Fall Break
Lift!!

EXIT
31


WELCOME

TAKE HOME POINTS

- Power isn't just about athletes, but athletes could use many of the foundations we discussed.
- Because of the neurological demands of power, such exercises should be placed early in the workout after a good warm-up and not trained to exhaustion especially when first learning.
- Start with learning how to move well in more stable environments and then how to accelerate load in that position.
- Be aware of the deceleration loads and variables that help build better resilience.
- Speed increases instability so use this as one of your last progressions.
- Trying to fire that canon from a canoe doesn't work, have a system in building better progressions.
- Power can have many health as well as fitness benefits so be thoughtful about your programming.

THANK YOU!