

Writing the Exercise Prescription

W. Scott Black, MD
University Health Service
University of Kentucky

Faculty Disclosure

- I have nothing to declare.

Educational Need/Practice Gap

Gap

It is estimated that about 23% of adult women and 18% of adult men have been advised to increase their physical activity levels by a healthcare professional

Need

The number of US adults meeting recommended physical activity levels has not changed since the Report on Physical Activity and Health was published in 1996. It remains at about 25% across the population and varies by race/ethnicity and location with **rural states in the South and Midwest demonstrating the highest levels of physical inactivity in the United States.**

Learning Objectives

- Upon completion of the session, participants will be able to
 1. Discuss the evidence that physical activity has substantial wellbeing benefits.
 2. Discuss the difference between physical activity and exercise.
 3. Describe the S.A.I.D. (Specific Adaptations to Imposed Demands) Principle of Exercise.
 4. Write an Exercise Prescription that promotes the current national guidelines for physical activity among adults.

Expected Outcome

- The purpose of this presentation is to increase the likelihood that attending healthcare providers will promote physical activity among their patients as part of their routine practice.

The Polypill!

Perspective | Published: 11 March 2025

The journey of the cardiovascular polypill from its conception to the WHO List of Essential Medicines

[Valentin Fuster](#) , [Gines Sanz](#) & [Jose M. Castellano](#)

[Nature Cardiovascular Research](#) **4**, 259–265 (2025) | [Cite this article](#)

Medical & Health Benefits of Regular Exercise

Benefit Category 	Specific Health Benefits
<u>Cardiovascular Health</u>	Lowers blood pressure, reduces stroke risk, boosts HDL (good) cholesterol, decreases triglycerides, and strengthens heart function.
<u>Metabolic Health</u>	Improves insulin sensitivity, manages blood sugar levels, reduces risk of type 2 diabetes, and helps manage obesity.
<u>Musculoskeletal</u>	Increases muscle strength, maintains flexibility, builds bone density (preventing osteoporosis), and prevents falls in older adults.
<u>Mental Health</u>	Reduces anxiety and depression, manages stress, improves cognitive function, enhances sleep quality, and boosts mood.
<u>Cancer Risk Reduction</u>	Lowers risk of various cancers, including colon, breast, uterine, bladder, lung, and stomach cancers.
<u>Overall Longevity</u>	Lower risk of premature mortality and increased longevity.
<u>Functional Ability</u>	Improves balance, coordination, and independence, especially for seniors.
<u>Sexual/Other Health</u>	Boosts energy levels, enhances sex life, reduces erectile dysfunction risk, and improves immune function.

Is Exercise Even Good for Me?????



Physical Activity vs Exercise

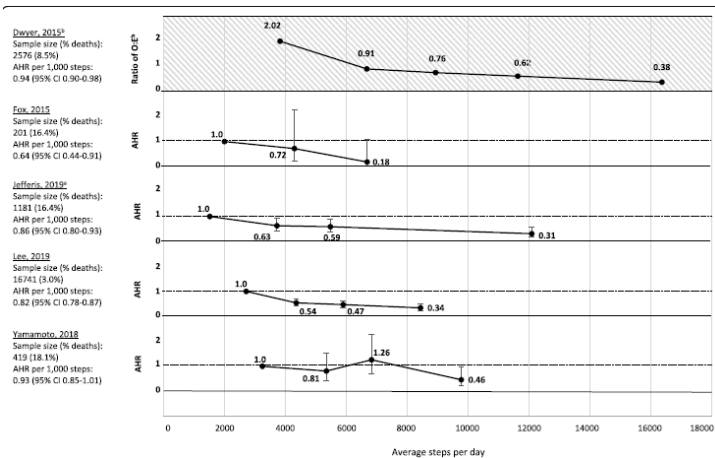
- Physical Activity
 - Work or movement that you either must do or choose to do.
 - Must Do: Work and Chores
 - Choose To Do: Play and Fun



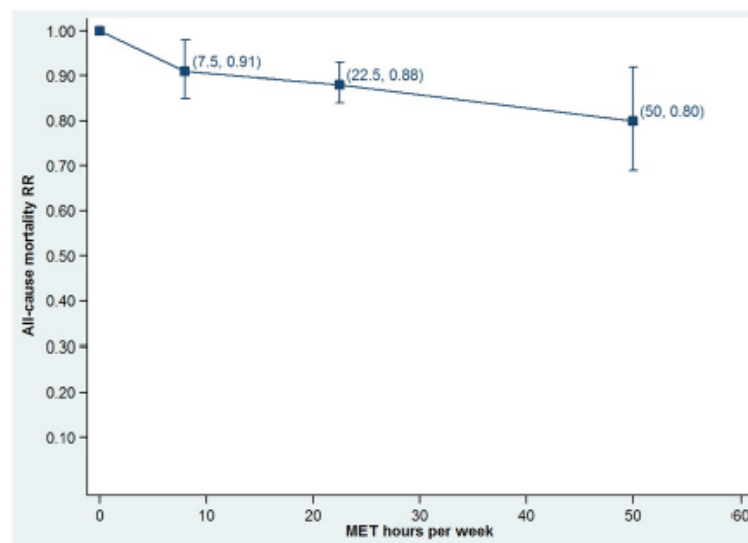
Physical Activity vs Exercise

- Exercise
 - Work or movement that you choose to do that *also has a purpose or goal*
 - It may be more structured
 - “Training”

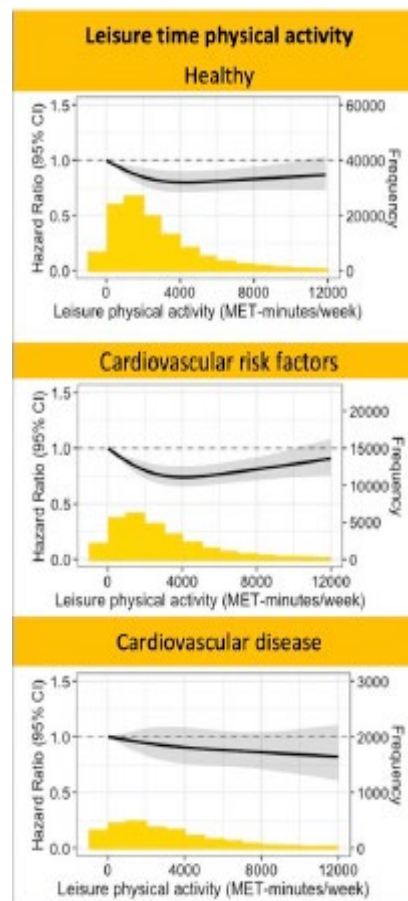




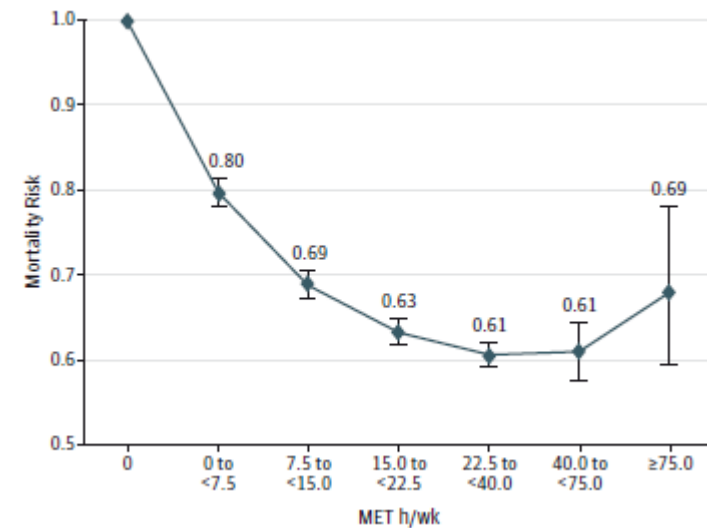
Hall et al. International Journal of Behavioral Nutrition and Physical Activity (2020) 17:78
<https://doi.org/10.1186/s12966-020-00978-9>



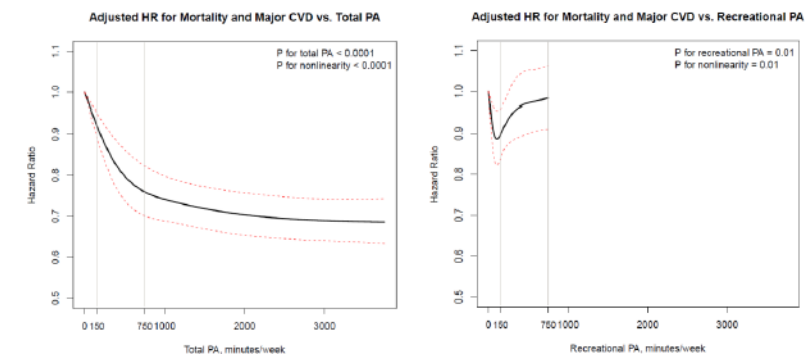
Kelly et al. International Journal of Behavioral Nutrition and Physical Activity 2014, 11:132
<http://www.ijbnpa.org/content/11/1/132>



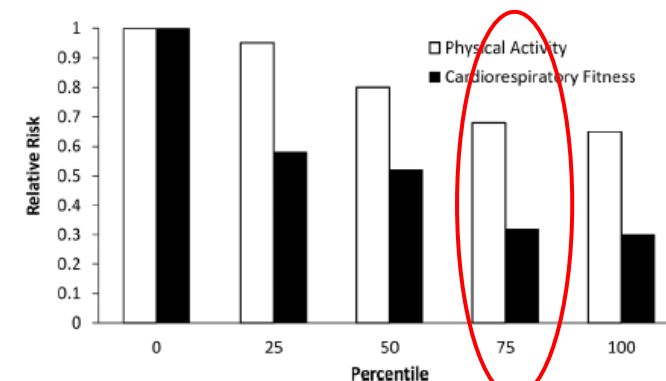
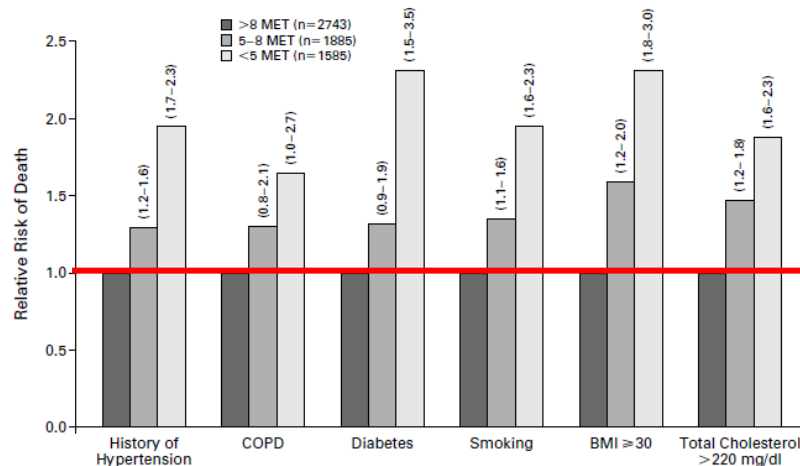
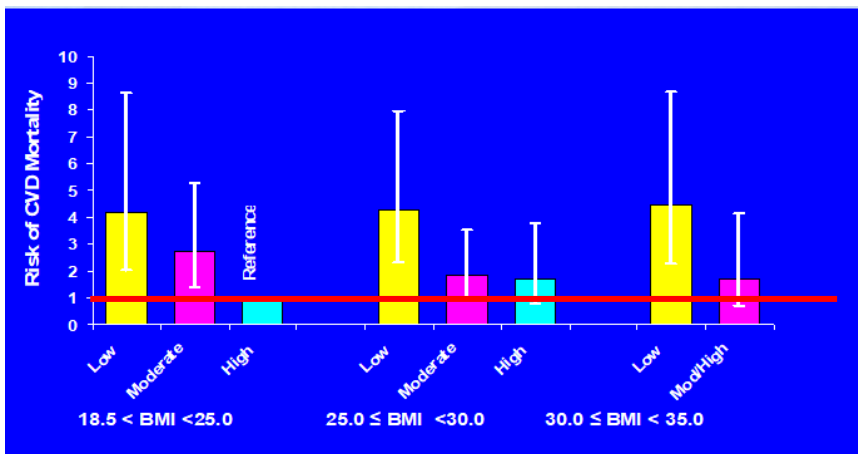
PLOS Medicine |
<https://doi.org/10.1371/journal.pmed.1003845>
 December 2, 2021



JAMA Intern Med. 2015;175(6):959-967.
 doi:10.1001/jamainternmed.2015.0533
 Published online April 6, 2015.



[https://doi.org/10.1016/S0140-6736\(17\)31634-3](https://doi.org/10.1016/S0140-6736(17)31634-3)



Med Sci Sports Exerc
2001;33(5):754-61

Table 4. Rates and Hazard Ratios of Cardiovascular Disease Death by Cardiorespiratory Fitness Level Quantified in 1-MET Increments Obtained During a Maximal Treadmill Test

METs	No. of Patients	Man-Years	No. of Deaths	Rate*	HR (95% CI)†	HR (95% CI)‡
<7.0	126	1602	31	142.8	2.8 (1.6-4.7)	1.6 (0.9-2.8)
7.0-7.9	205	3117	35	110.8	2.1 (1.3-3.5)	1.7 (1.0-2.8)
8.0-8.9	293	4159	35	91.7	1.8 (1.1-2.9)	1.6 (0.9-2.6)
9.0-9.9	415	6450	27	51.8	1.0 (Reference)	1.0 (Reference)
10.0-10.9	486	8078	26	41.8	0.8 (0.5-1.4)	0.9 (0.5-1.5)
11.0-11.9	299	5014	14	40.6	0.8 (0.4-1.5)	0.9 (0.5-1.8)
12.0-12.9	242	4168	5	17.1	0.3 (0.1-0.9)	0.3 (0.1-0.9)
≥13.0	250	4118	6	23.1	0.4 (0.2-1.1)	0.6 (0.3-1.4)

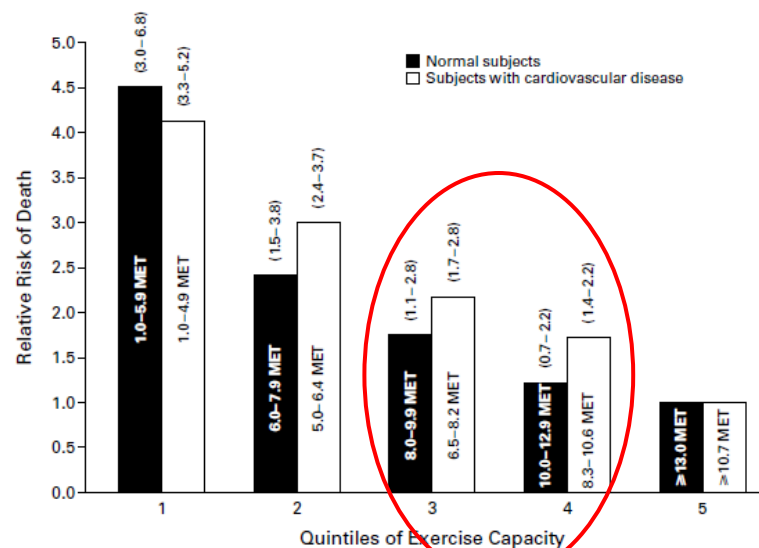
Abbreviations: CI, confidence interval; HR, hazard ratio from Cox proportional hazard models; METs, metabolic equivalents (1 MET = 3.5 mL of oxygen uptake/kg⁻¹ per minute⁻¹).

*Per 10 000 man-years with adjustment for age and examination year.

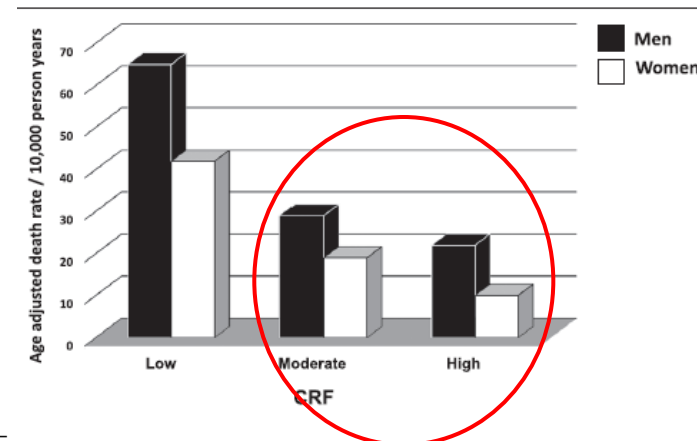
†Adjusted for age and examination year (*P* value for trend, <.001).

‡Adjusted for age, examination year, fasting glucose level, systolic blood pressure, parental history of premature cardiovascular disease, total cholesterol level, cigarette smoking, abnormal resting, and exercise electrocardiograms (*P* value for trend, <.001).

Church TS et al. *Arch Int Med* 2005; 165:2114



N Engl J Med, Vol. 346, No. 11 • March 14, 2002



JAMA. 1989;262:2395-2401

Physical Activity vs Physical Fitness

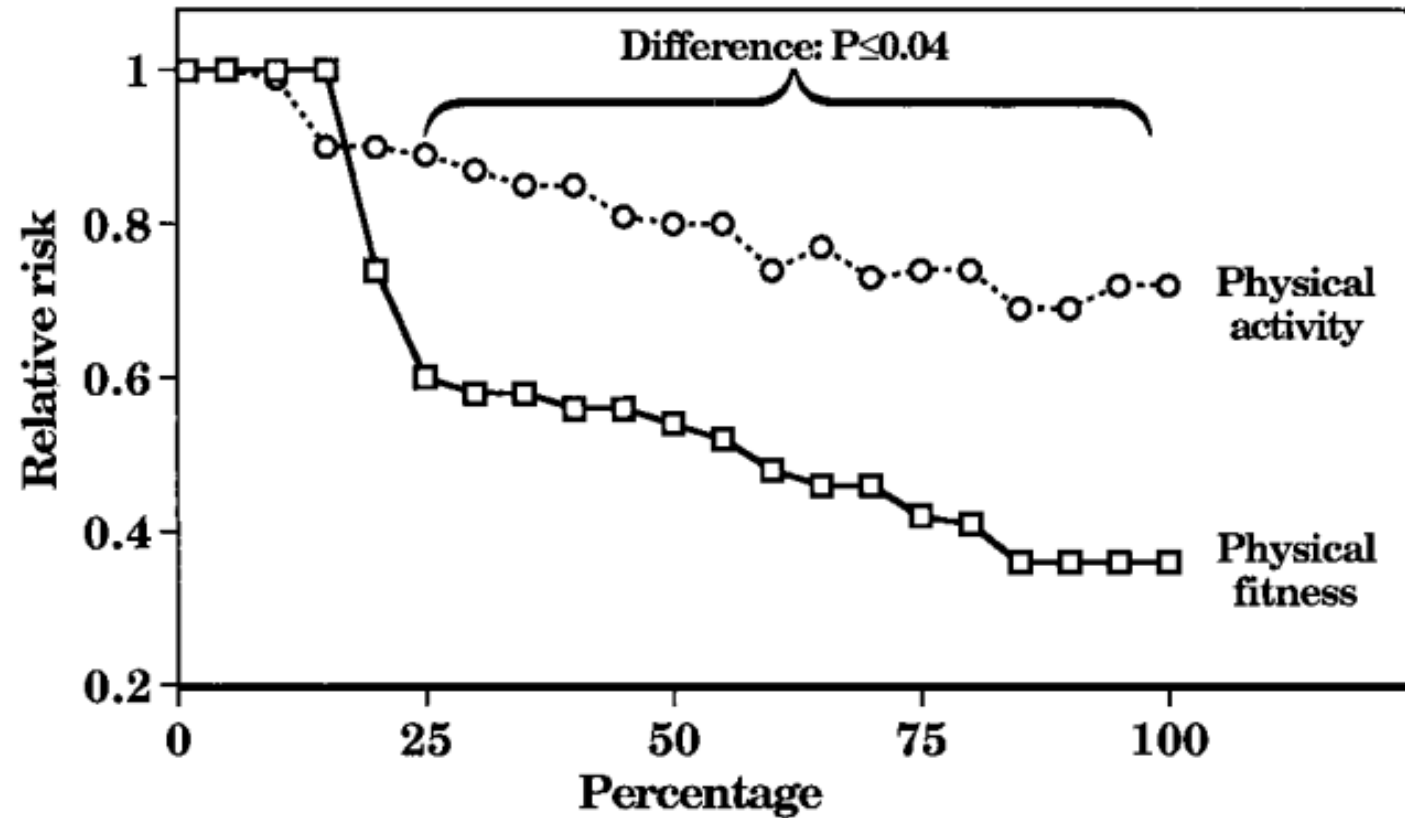
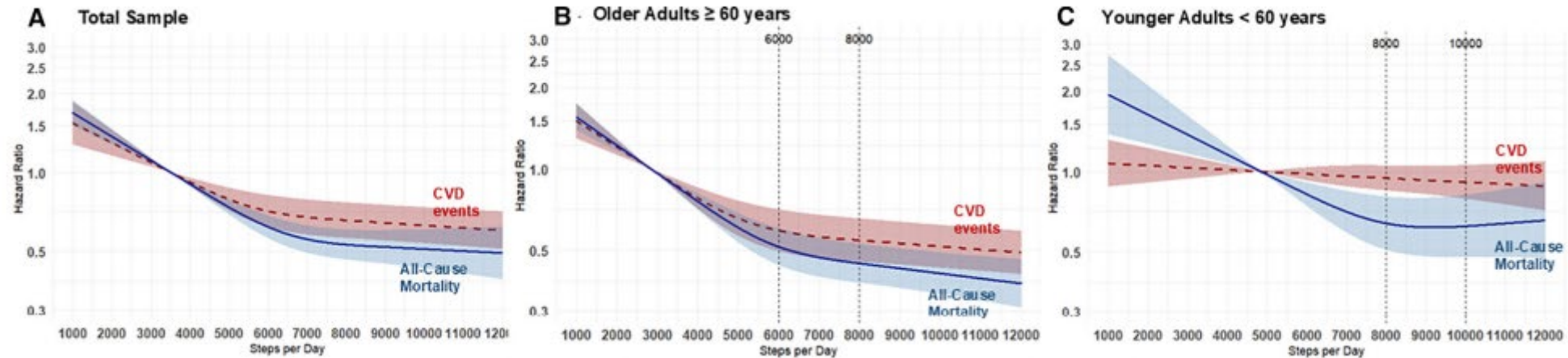


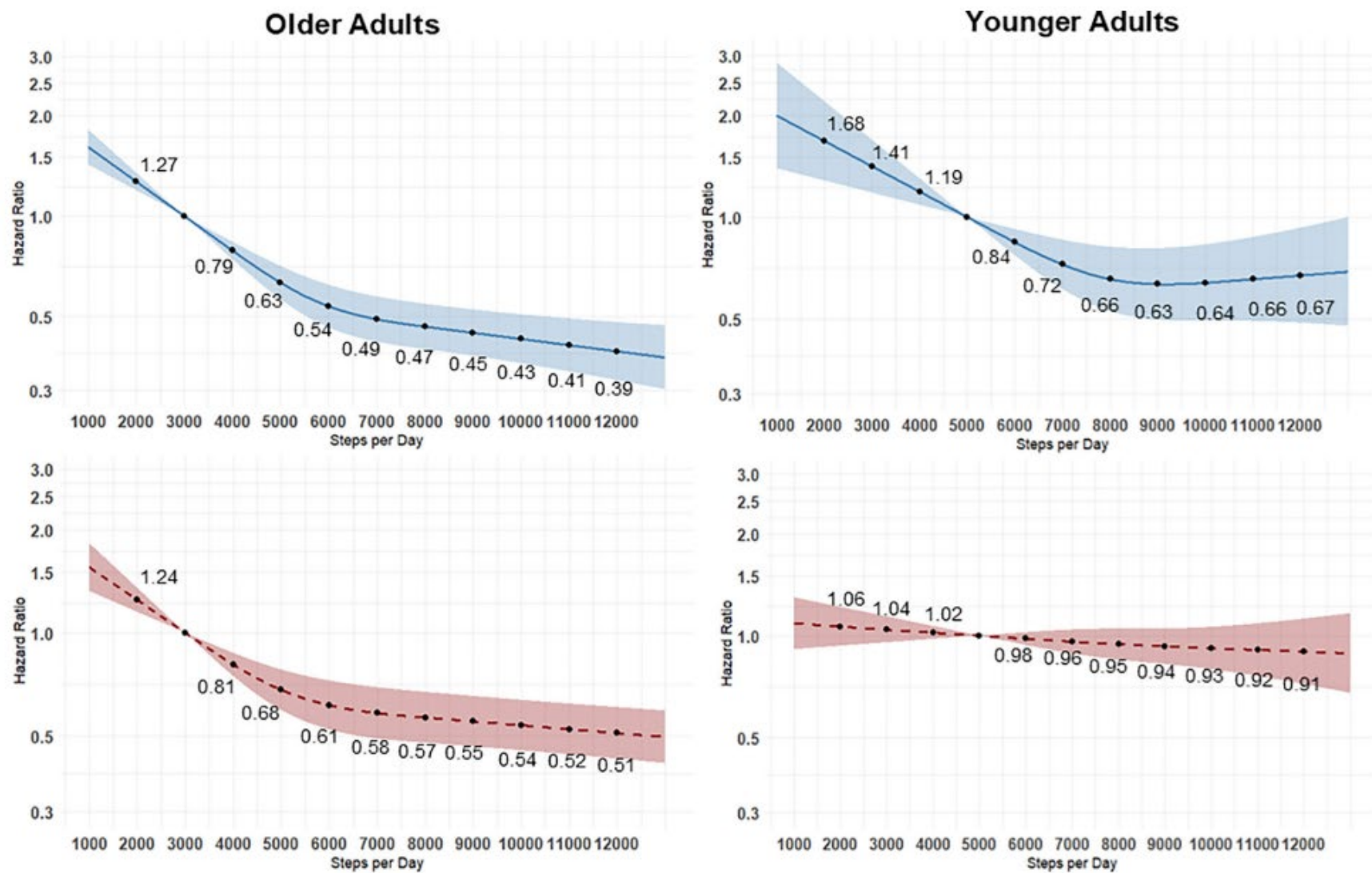
FIGURE 2—Estimated dose-response curve for the relative risk of either CHD or CVD by sample percentages of fitness and physical activity. Studies weighted by person-years of experience.

Williams PT.
MSSE;33(5):754-61,2001

The Study Population Matters!



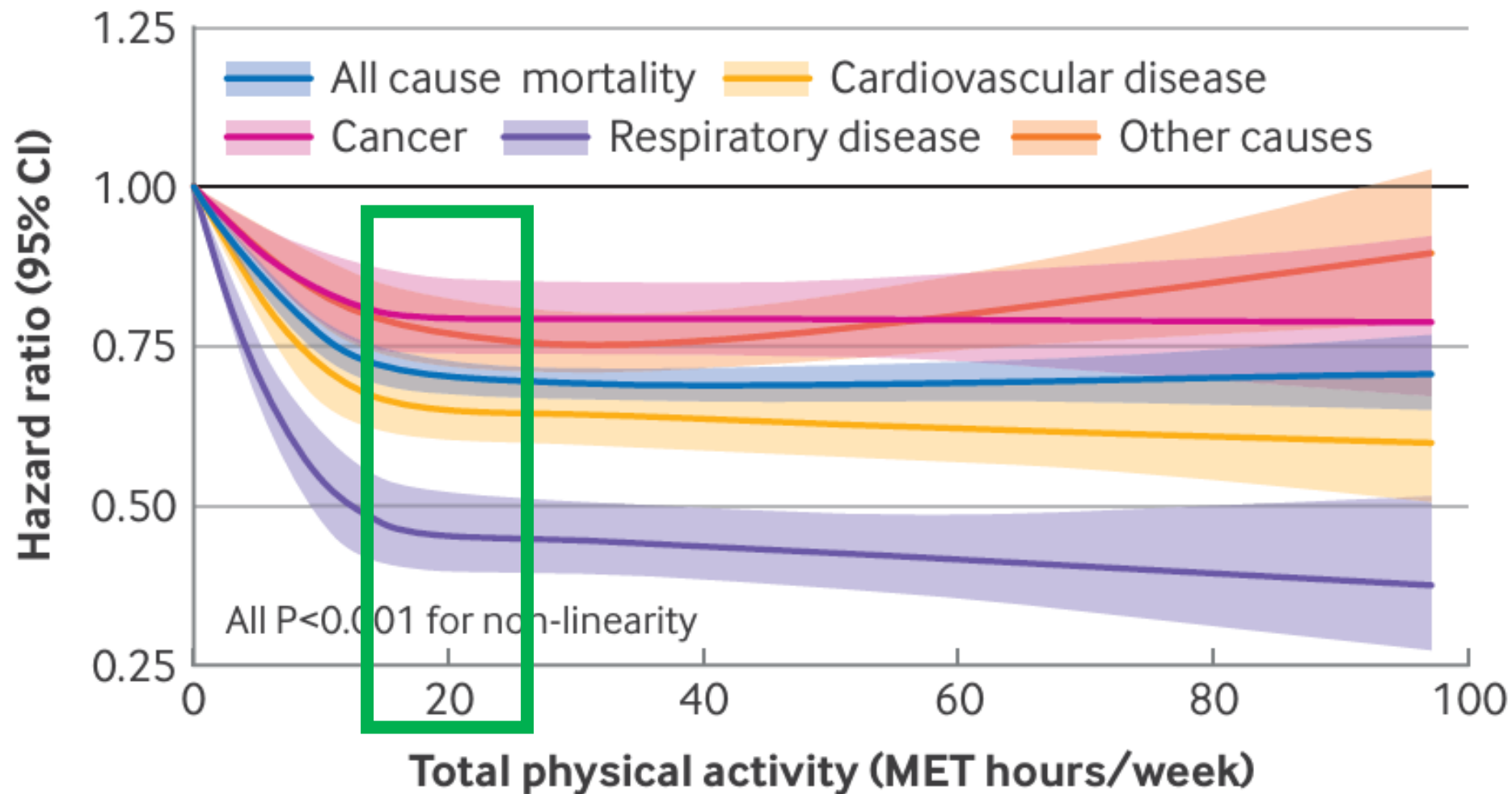
Paluch, et al. ESSR (2026)54(1):15-25



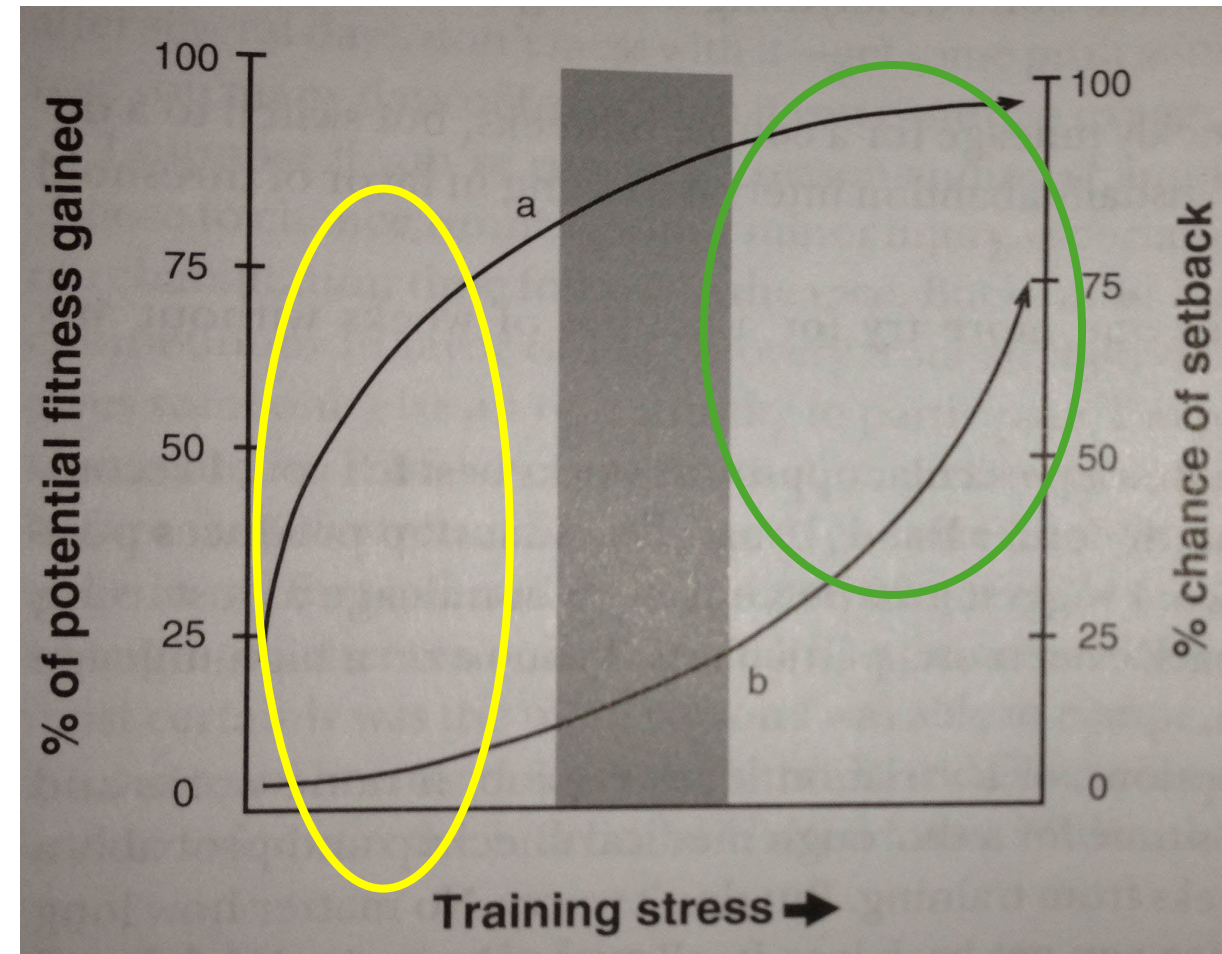
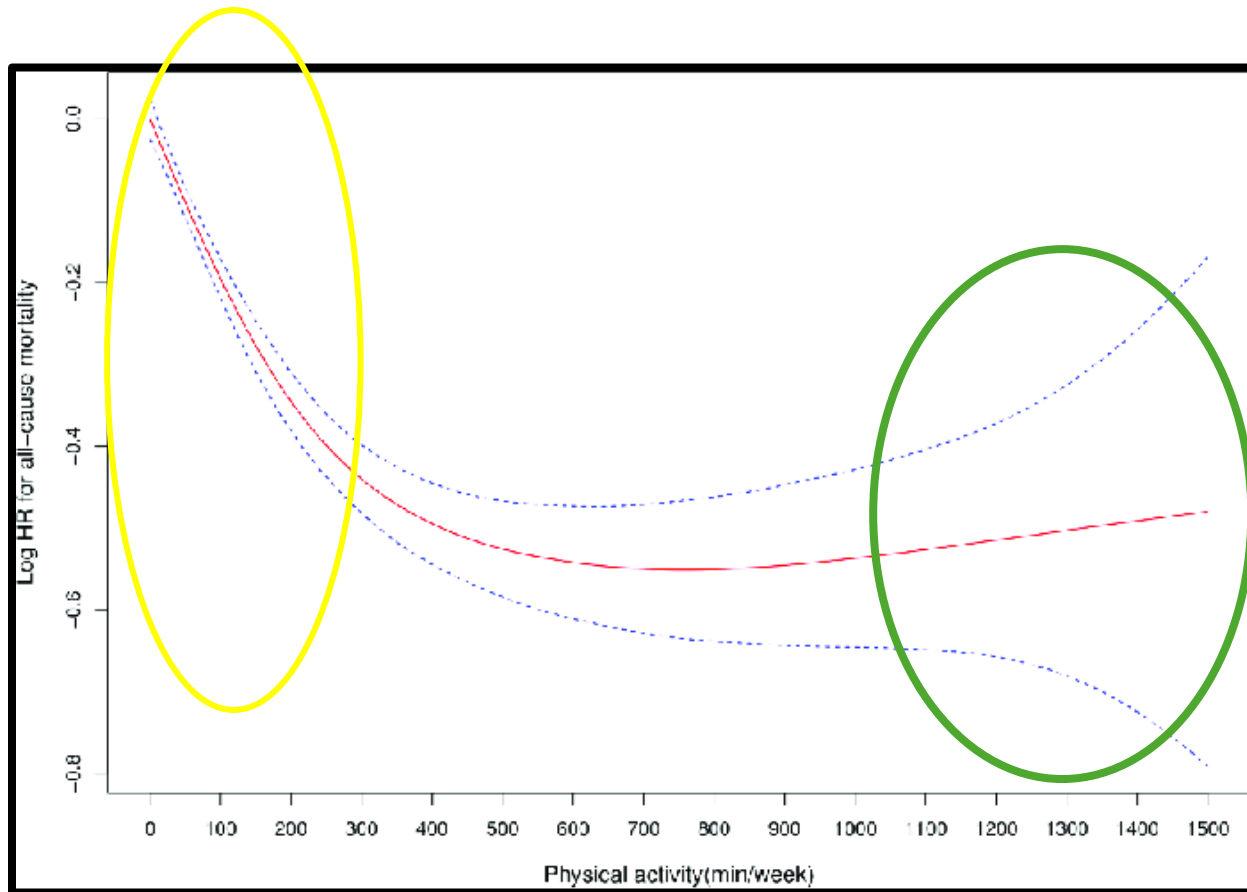
Paluch, et al. ESSR (2026)54(1):15-25

BREAKING NEWS

Cite this as: *BMJ MED*
2026;5:e001513. doi:10.1136/
bmjmed-2025-001513



“Everything” You Need to Know About Aerobic Training



What is a MET?

- MET = Metabolic Equivalent
 - Measure of Energy Expenditure
 - 1 MET = Metabolic Energy Expenditure at Rest
 - 3.5 ml O₂ / kg / min
 - 1 kcal / kg / hour
- Light Activity < 3.0 METS
- Moderate Activity 3.0 – 5.9 METS
- Vigorous Activity ≥ 6.0 METS

www.pacompendium.com

Compendium of Physical Activities

Quantifying Physical Activity Energy Expenditure

Search

Search

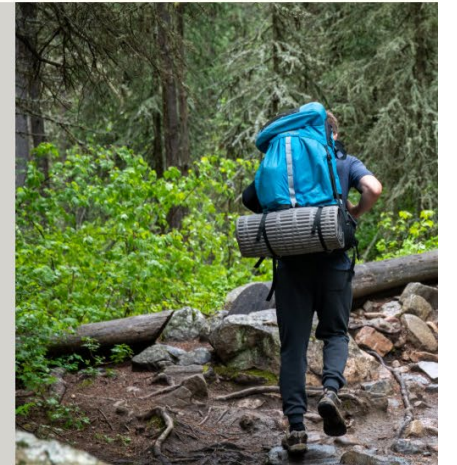
Adult Compendium

Older Adult Compendium

Wheelchair Compendium

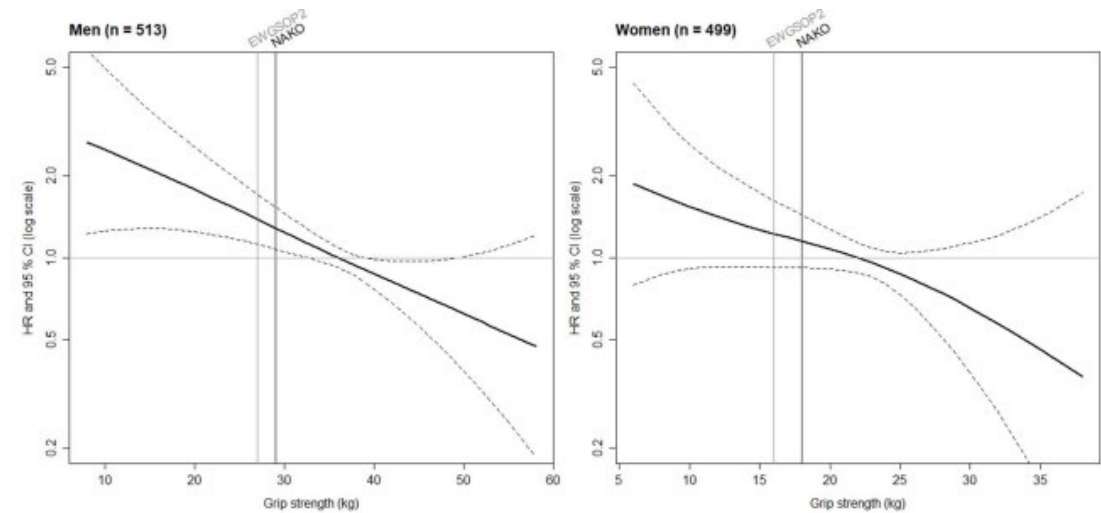
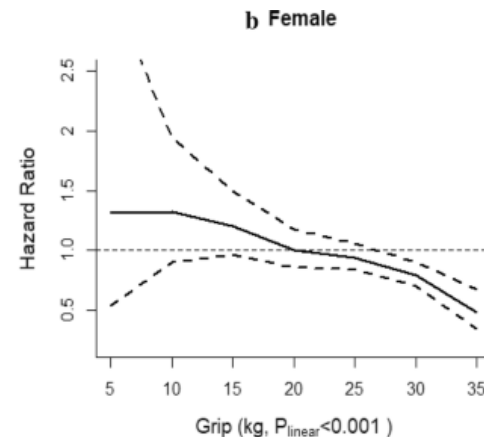
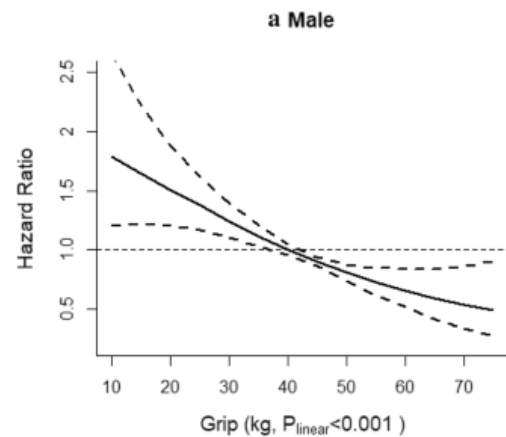
2024 Compendium of Physical Activities

Published January 2024 in the [Journal of Sport and Health Science](#)



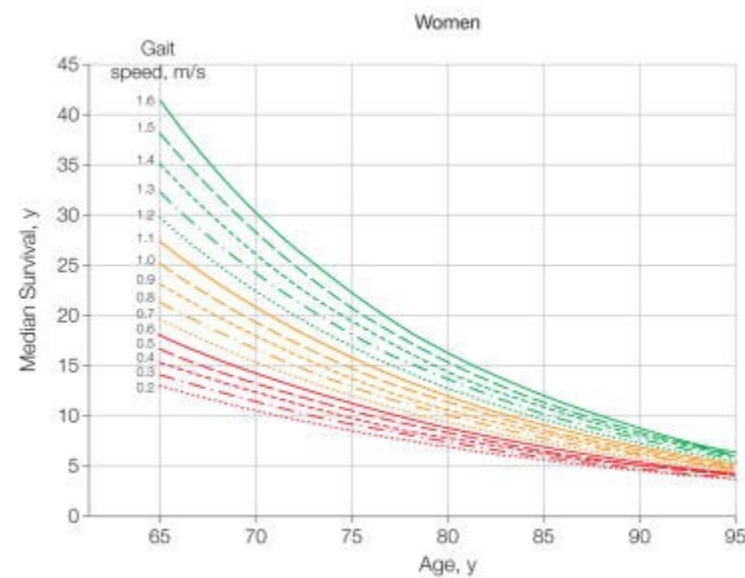
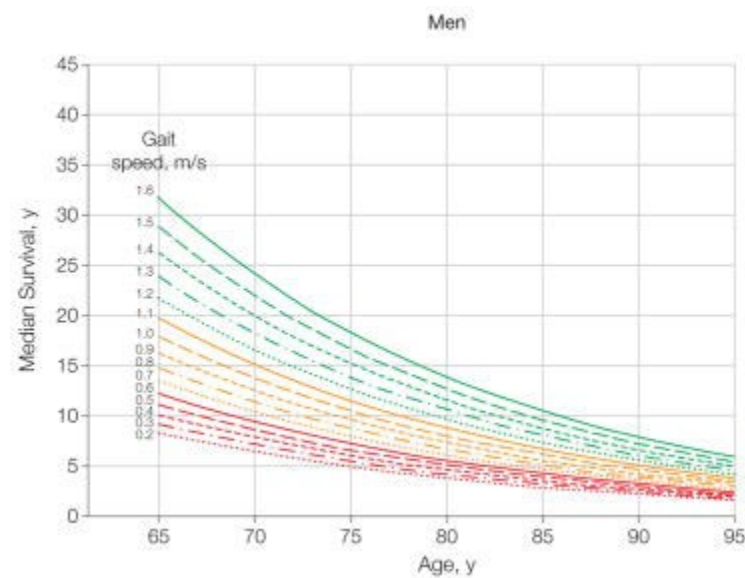
What About Strength?



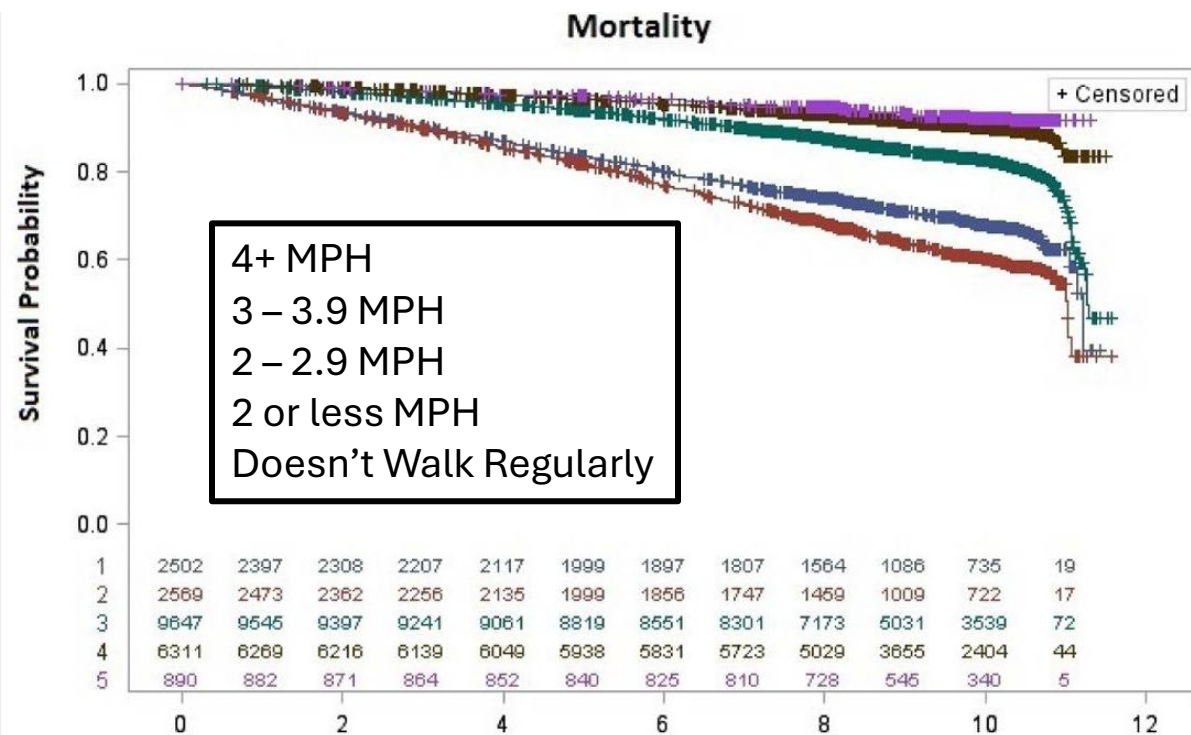


Cai, Y., Liu, L., Wang, J. *et al.* Linear association between grip strength and all-cause mortality among the elderly: results from the SHARE study. *Aging Clin Exp Res* **33**, 933–941 (2021). <https://doi.org/10.1007/s40520-020-01614-z>

Huemer M-T, Kluttig A, et al. Grip strength values and cutpoints...Age and Ageing 52, 1-10 (2023).

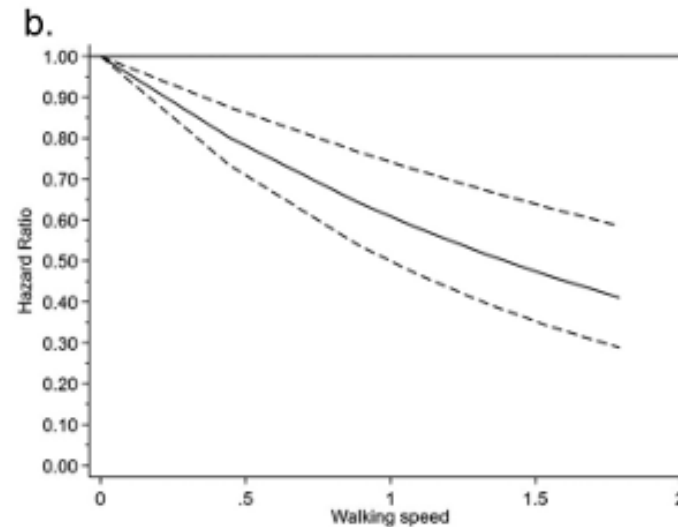
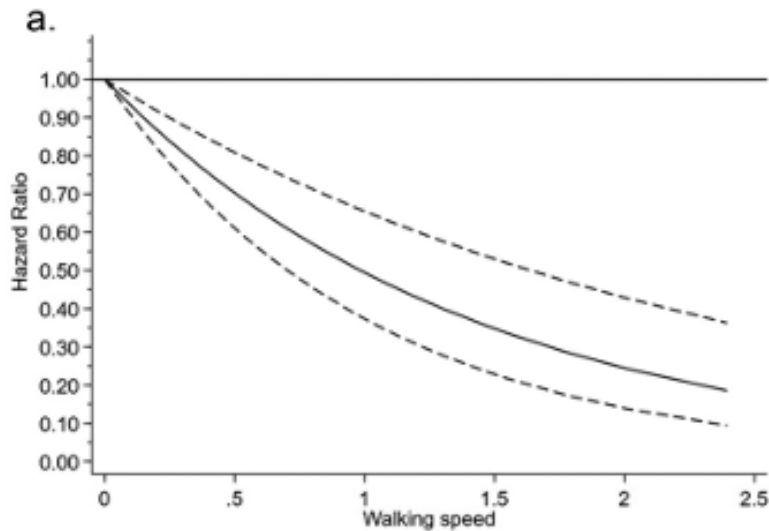


Studenski S, Perera S, et al. Gait speed and survival in older adults. *JAMA*(2011);305(1):50-58



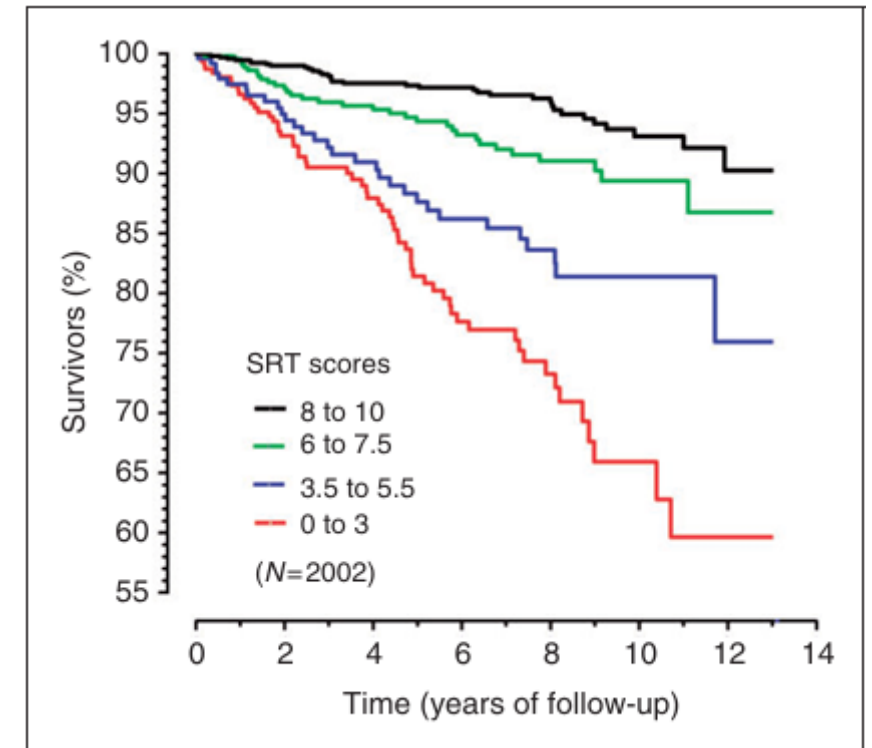
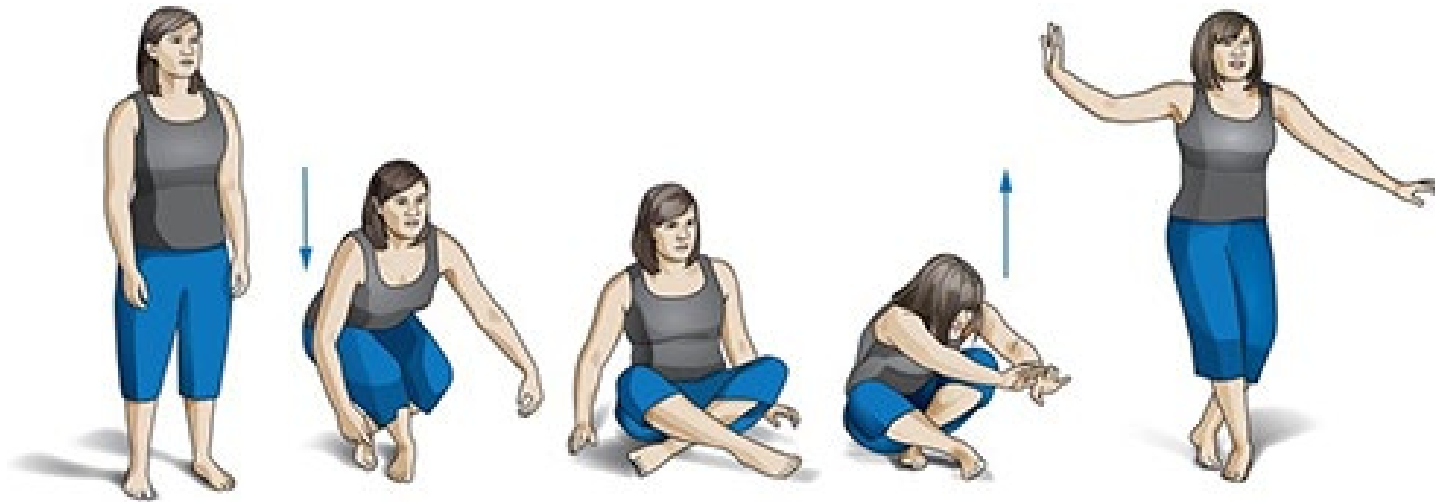
Atherosclerosis. 2019 October;
289:51-56.

Nearly 22,000 male physicians with a mean age of
67.8 +/- 9.0 years



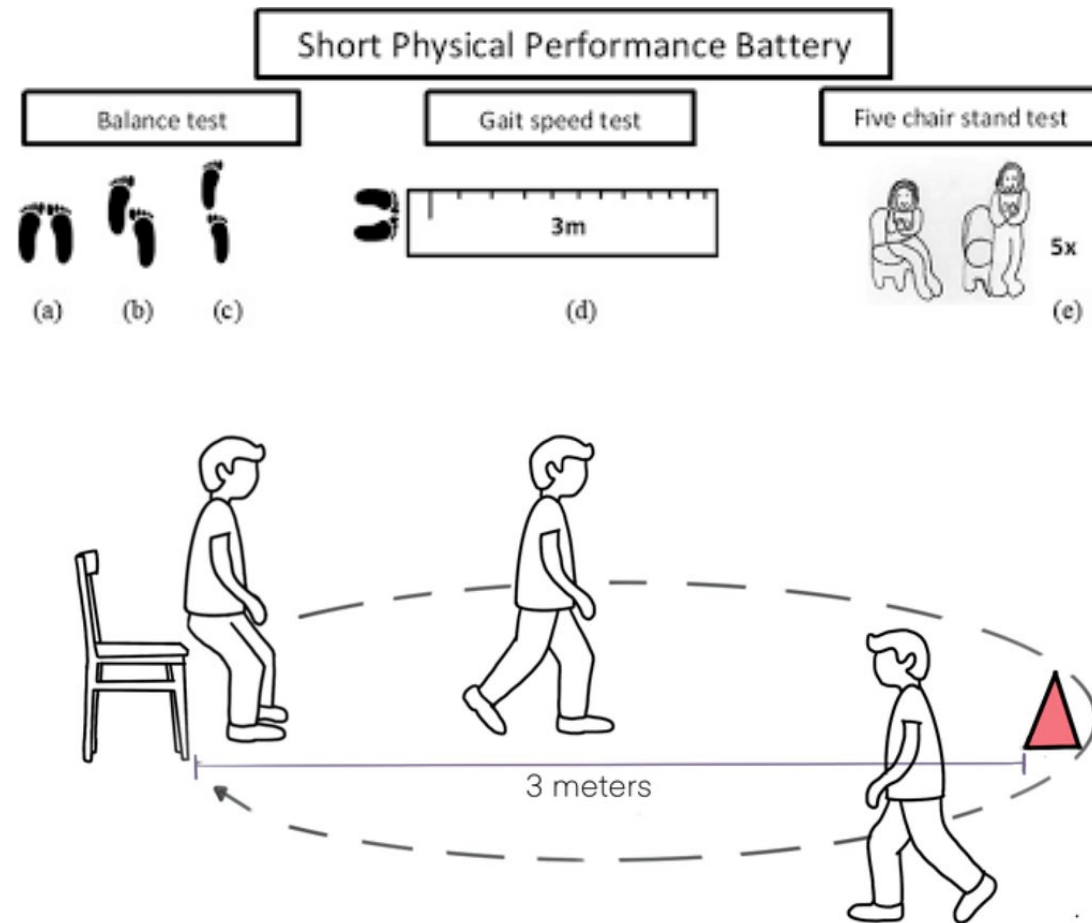
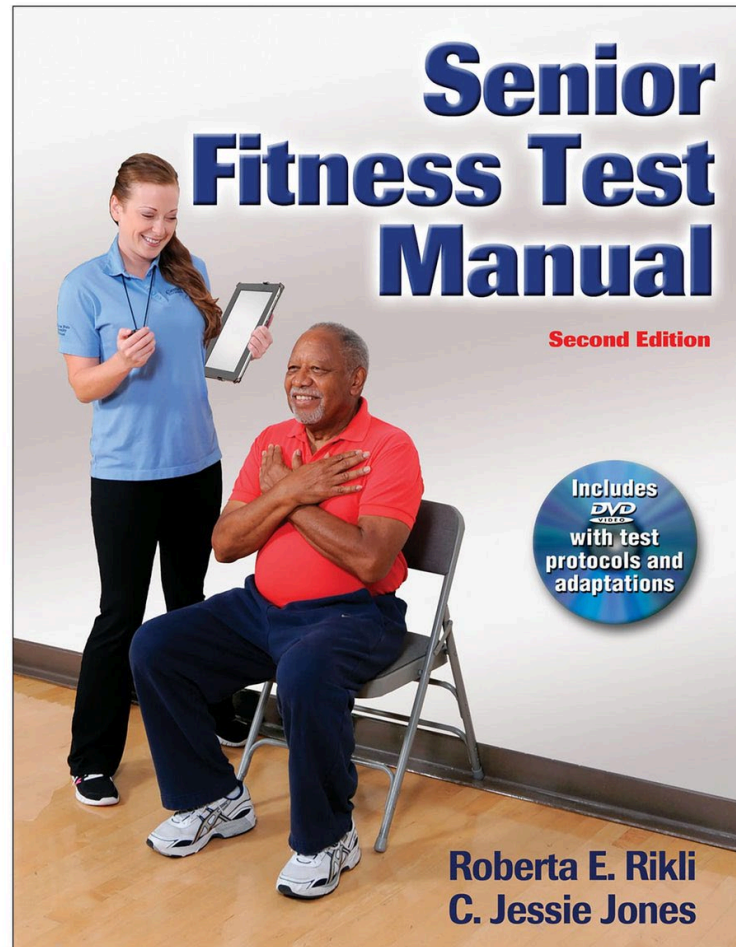
JOURNAL OF SPORTS SCIENCES
2024, VOL. 42, NO. 14, 1313–1322
<https://doi.org/10.1080/02640414.2024.2390302>

The Sitting – Rising Test



European Journal of Preventive
Cardiology
2014, Vol. 21(7) 892–898

Office Based Tests of Strength & Balance

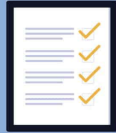


Let's Talk About Training...

The SAID Principle

S

Specific



A

Adaptations to



I

Imposed

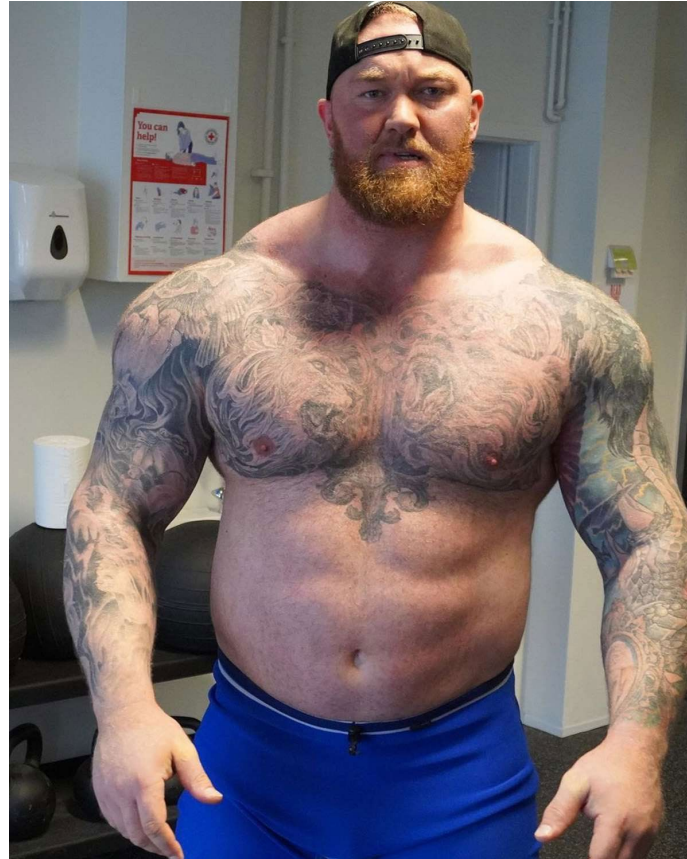


D

Demands



S.A.I.D. Principle (Specific Adaptations to Imposed Demands)

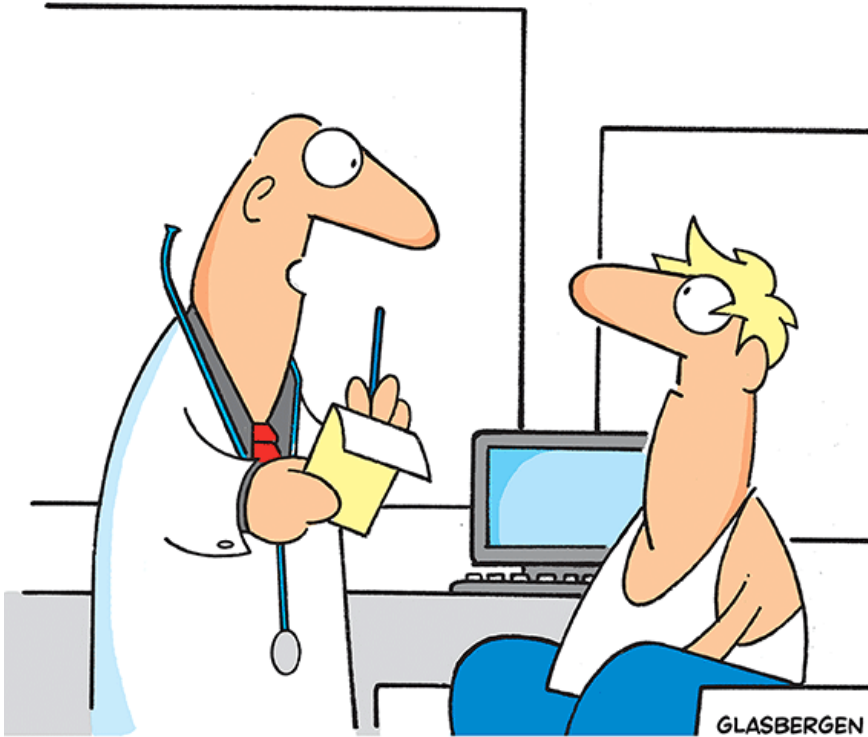


I S.A.I.D. That Specificity Matters!



Writing the Exercise Prescription

© Randy Glasbergen / glasbergen.com



"I'm prescribing exercise. Think of it as a stress pill that takes 30 minutes to swallow."

FITNESS EXPERTS
SAY YOUR MUSCLES
NEED PLENTY OF
REST BETWEEN
WORKOUTS!

YOUR LAST
WORKOUT WAS
17 YEARS AGO.



What Is the Best Exercise Plan?

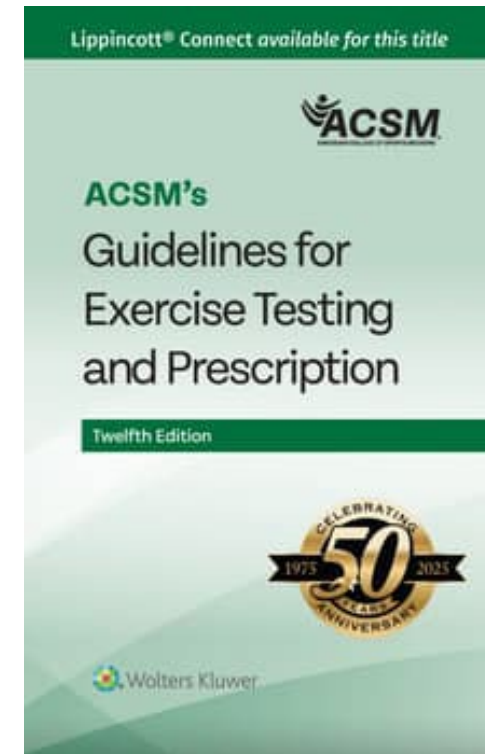
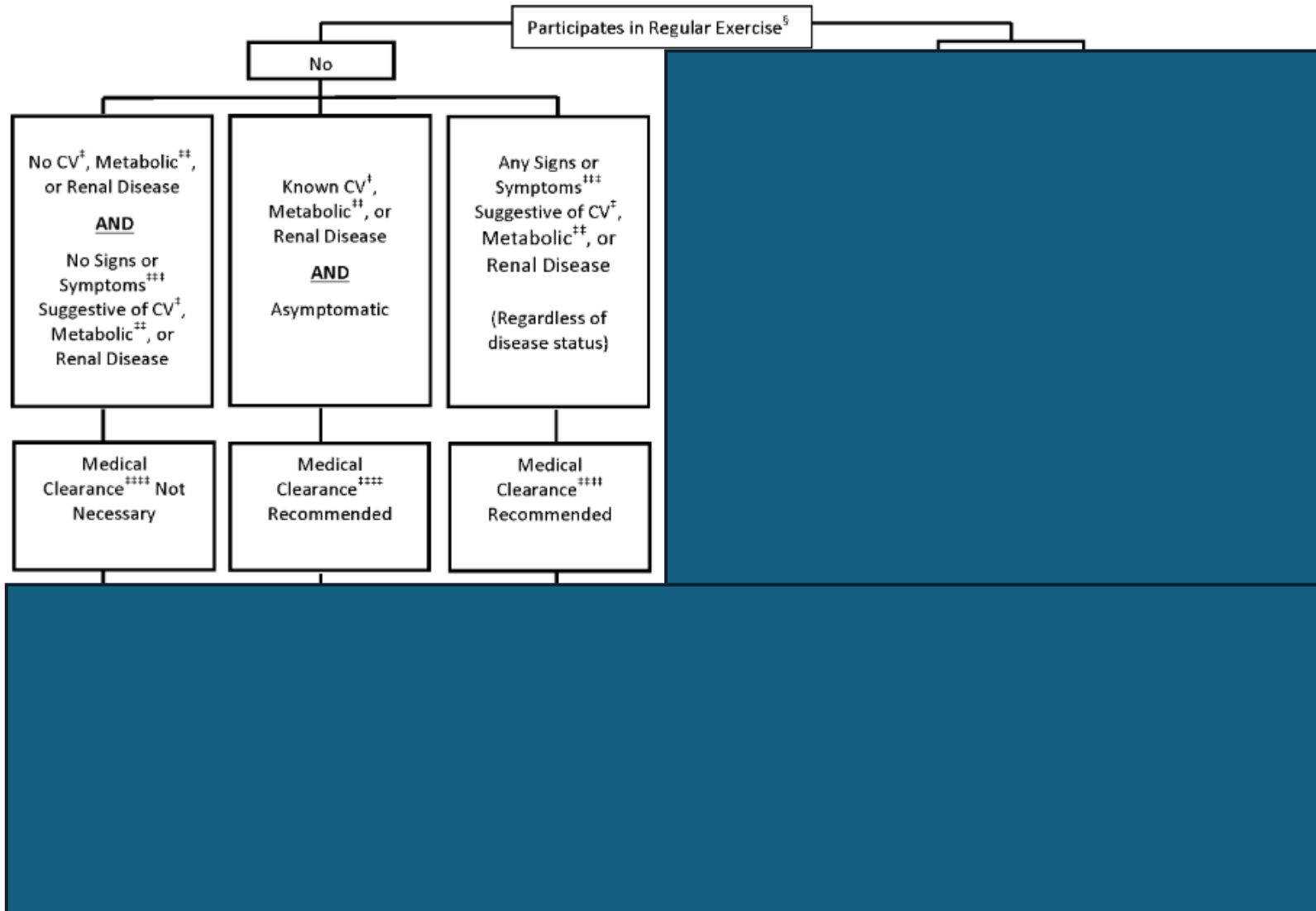
The One You'll Do



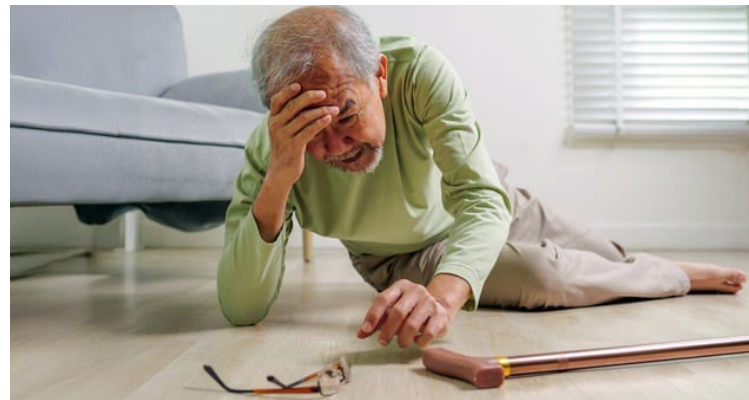
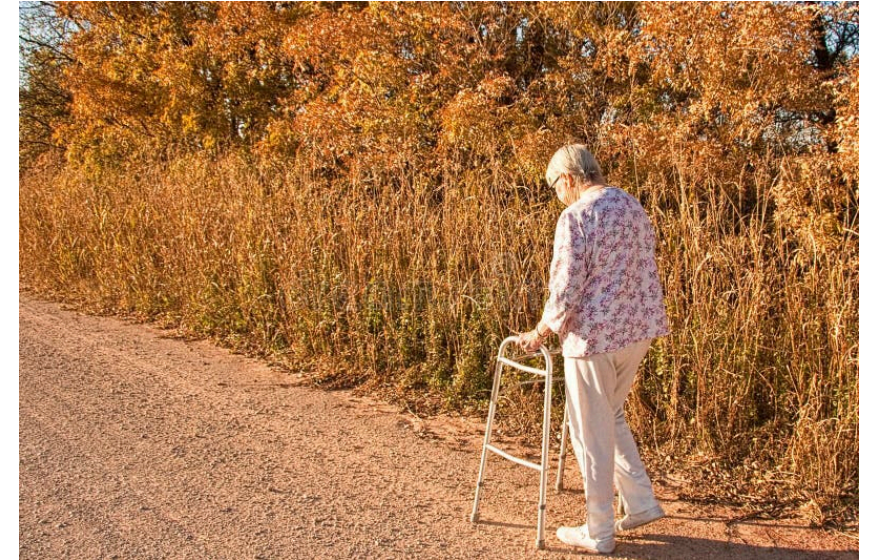
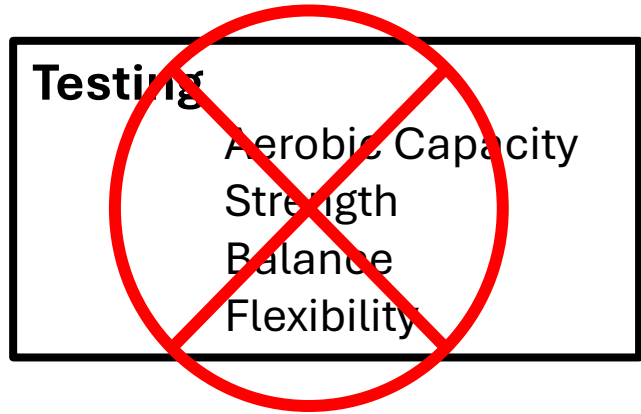
The One Proven to Work



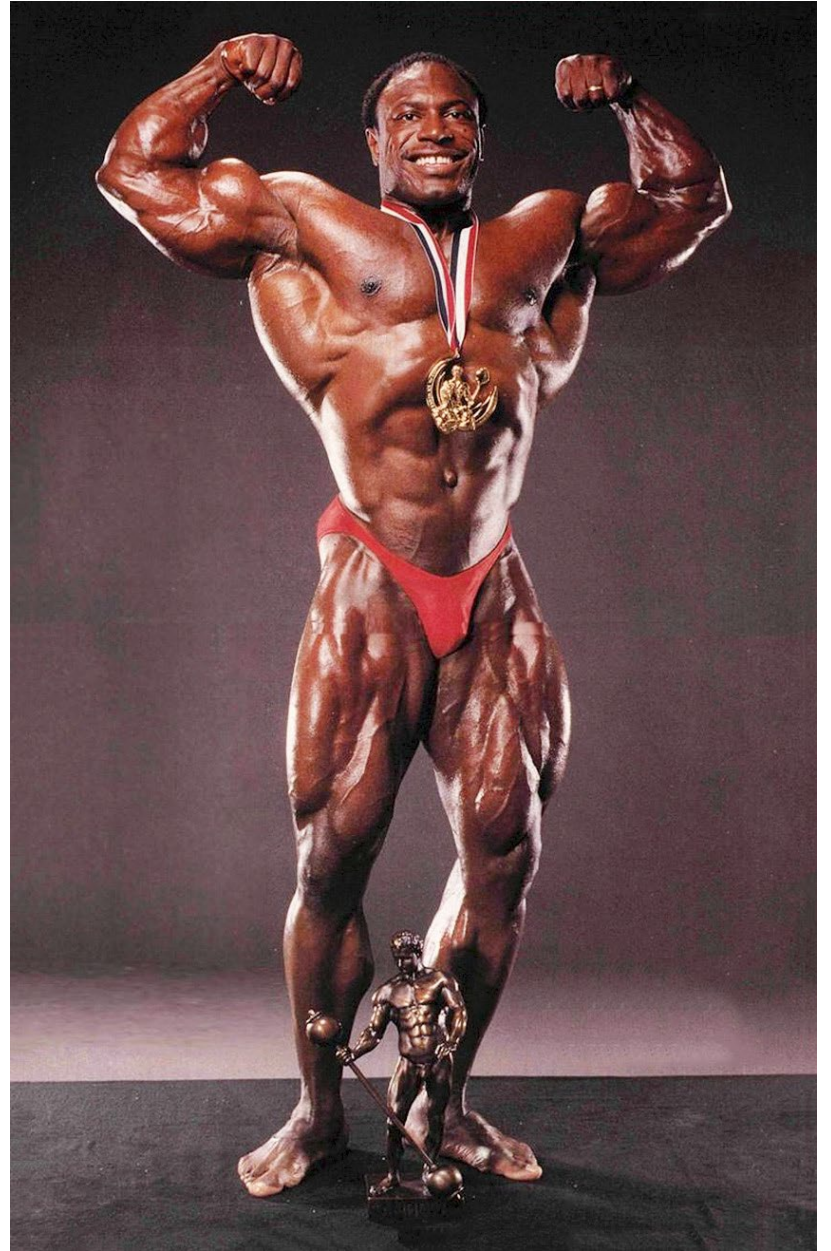
“Clearance”



Initial Needs Assessment



What is Your Goal?



Might Need Some Recalibration



Specific

What is my goal?

Measurable

How will you track your progress?

Achievable

Is your goal realistic?

Relevant

Does the goal align with your overall plan

Time Bound

Give your goal a deadline



FITT - VP

- **Frequency** How Often
- **Intensity** How Hard
- **Time** How Long
- **Type** How to Exercise
- **Volume** How Much
- **Progression** How to Move Forward

I'm Mainly Interested in Being Healthy!



ACSM & CDC
Recommendations

150 minutes
of moderate-intensity aerobic activity every week

2x per week
Muscle-strengthening activities that work all major muscle groups

How Do We Train Aerobic Fitness?

- Volume
 - Frequency X Duration
 - # Days / Week
 - # Minutes / Session
- Intensity
 - % HRmax
 - METS
 - RPE
- Recovery
 - Days “Off” / Week
 - Time Between Intervals

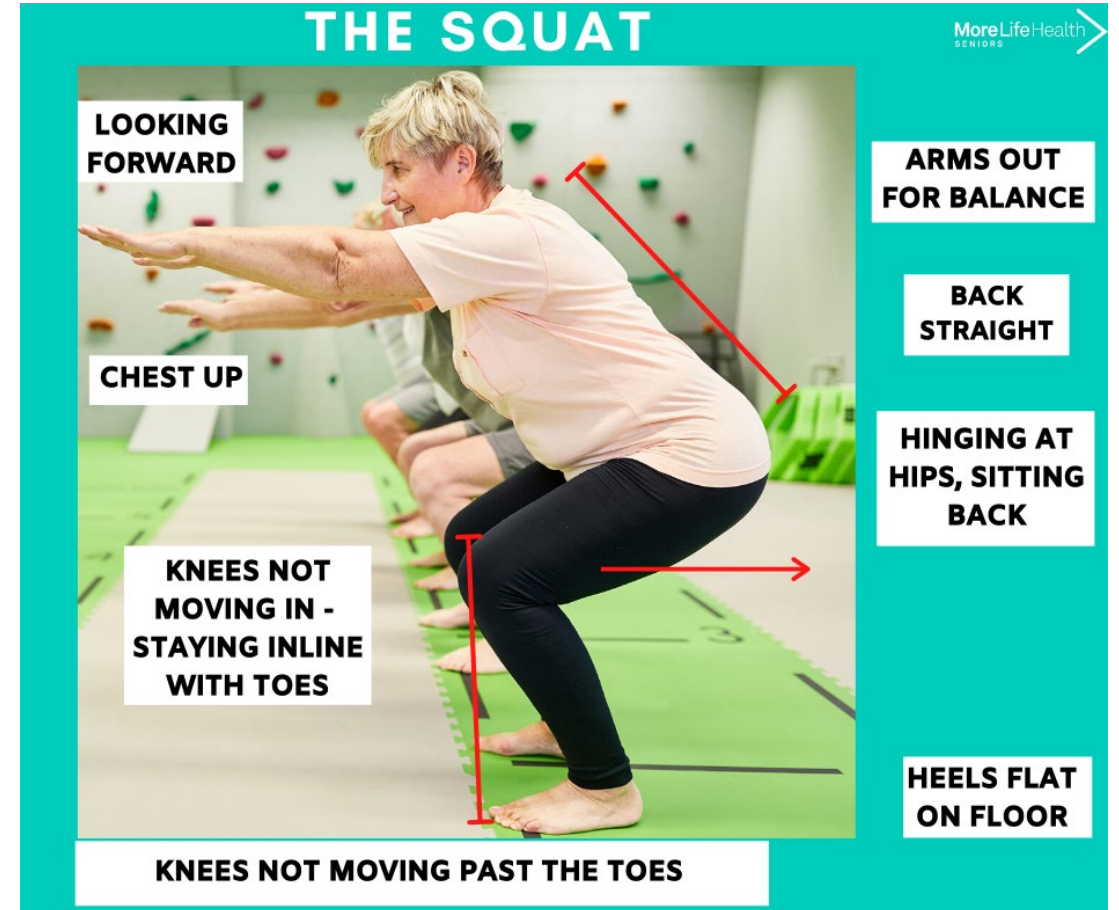
 CARDIOVASCULAR TRAINING		
RPE SCALE	EMOJI	INTENSITY LEVEL...
9 - 10		MAXIMUM INTENSITY
7 - 8		VIGOROUS INTENSITY
5 - 6		MODERATE INTENSITY
3 - 4		LIGHT INTENSITY
1 - 2		VERY LIGHT INTENSITY

How Do We Train Strength?

- Squat / Lunge
 - Hinge / Lift
 - Push
 - Pull
 - Carry
- Twist
 - Stabilize
 - Jump / Throw

- At least 2 sets
- At least twice per week
- High Effort
 - 3 to 30 reps
 - Hard but not necessarily to failure

Squat



Hinge / Lift



Push



Pull



Carry



62-year-old, sedentary male with no significant medical problems or symptoms of disease wants to start an exercise program to improve his overall health and functional ability



- Squat / Lunge
- Hinge / Lift
- Push
- Pull
- Carry

Scott's Exercise Prescription

• Aerobic Prescription

- **F:** at least 5 days / week
- **I:** 3.5 MPH = 4.7 METS
- **T:** 30 minutes
- **T:** walking
- **V:** 705 MET-min / week or 11.75 MET-hours / week
- **P:** Goal = 15 MET-hours / week
 - $15 - 11.75 = 3.25$ MET-hours short
 - Add about 45 minutes walking / week
 - $(45 \times 4.7) / 60 = 3.5$ MET-hours
 - Progress to 40 minutes at least 5 days / week over 6 – 8 weeks

• Strength Prescription

- **F:** at least 2 days / week
- **I:** weights that are a challenge (but not impossible) to lift 10 times
- **T/V:** 2 sets of 10 repetitions each exercise
- **T:** Weightlifting
 - Squat = goblet squat or lunge
 - Lift = kettlebell deadlift
 - Push = bench press or overhead press
 - Pull = seated row (band) or dumbbell row
 - Carry = farmer's carry or side carry
- **P:** Increase weight to keep last 2 reps of 2nd set hard to complete

