

Issues in the Design of Randomized Controlled Dose Response Intervention Studies in PA and Health

Physical Activity and
Public Health
Columbia, SC
16 September 2022
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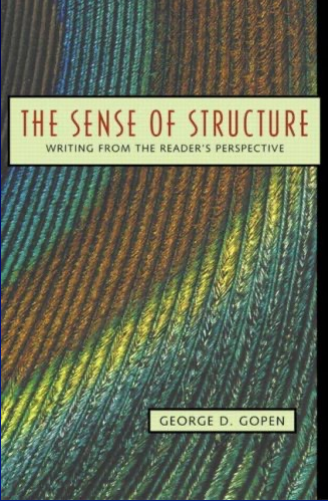
What Will I Get Out of This Talk?

If I am fortunate, three things!

What's with this Kraus Guy?

- Note Taking
- Prolonged Sitting

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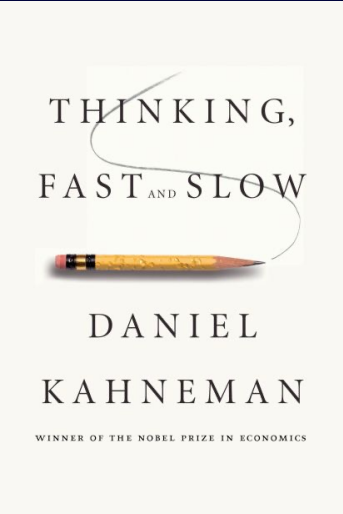


Read this Book:

The Sense of Structure

George D. Gopen

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Read this Book:

Thinking Fast and Slow

Daniel Kahneman

The grandfather of Behavioral Economics



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Listen to this Podcast:

Hidden Brain

Shankar Vedantum
interviews
Leidy Klotz

“Do Less”
6 June 2022

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Why Do We Need Clinical Trials?

*Three studies where epidemiology has misled—
one of which caused significant excess morbidity
and mortality, one of which might have:*

- Arrhythmias and sudden cardiac death
-> CAST Trial
- HRT and CVD in post-menopausal women
-> HERS, WHI Trials
- Homocysteine and CVD risk
-> Folate replacement for prevention

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Standard Components of a Good Clinical Trial

- Randomized – to address unmeasured confounders at baseline
- Controlled – to address effect of unmeasured confounders
- Blinded – to control for treatment and measurement bias, especially in subjective measures

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Don't look at the slides

..... Behind the curtain

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Special Considerations for Randomized Controlled Exercise or PA Clinical Trials

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Considerations—PA Studies

- What is being tested
- The sex issue
- When to measure what
- These issues apply to population and cohort studies as well

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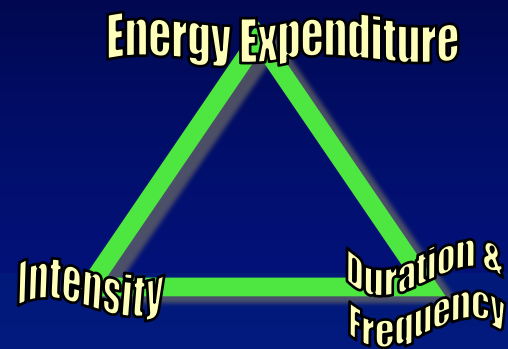
Considerations (1)

What is being tested?

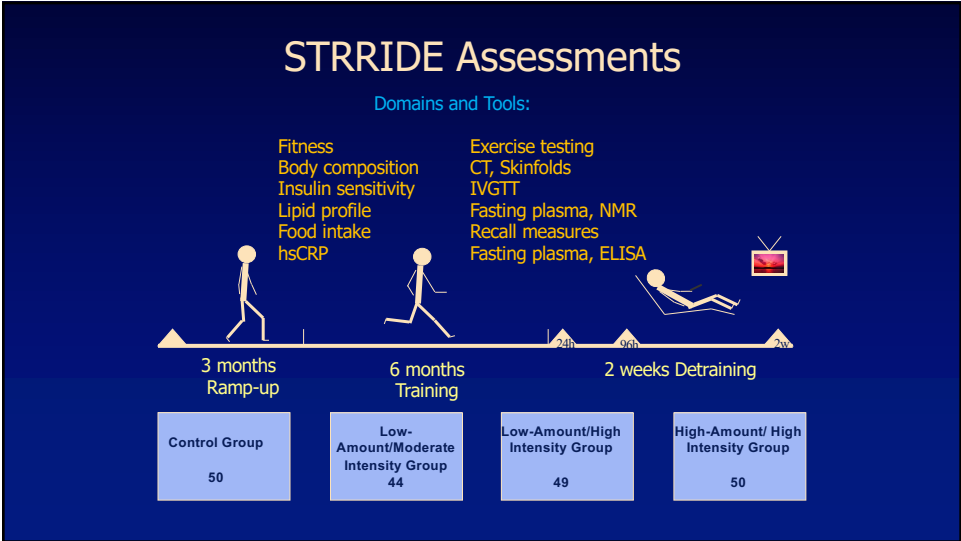
- Intensity
- Amount; over what period?
- Frequency
- Energy Expenditure

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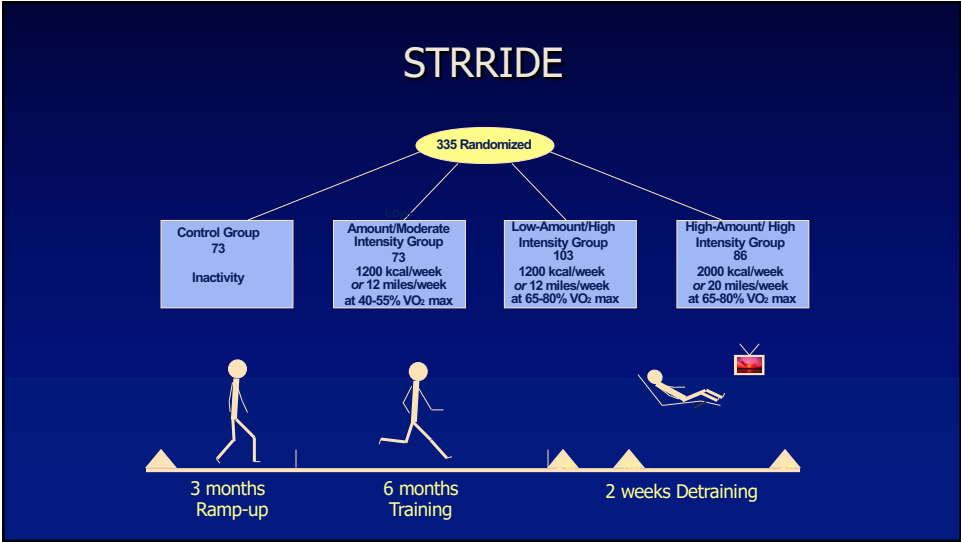
A Three Body Problem



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STRRIDE - Training Protocols

<u>Protocol</u>	<u>Intensity</u> (peak VO ₂)	<u>Amt</u> (kcal/wk)	<u>Min/wk</u> (min per wk)
Brisk Walking	13 miles/week	1300	170
Jogging	13 miles/week	1300	120
Jogging	22 miles/week	2200	170
Inactive	None		None

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STRRIDE - Training Protocols

<u>Protocol</u>	<u>Intensity</u> (peak VO ₂)	<u>Amount/Dose</u> (kcal/wk) (min per wk)	
Low/Mod	40-55%	1300	170
Low/Vigor	65-80%	1300	120
High/Vigor	65-80%	2200	170
Inactive	None	None	None

Annotations: 'Int' points to the Intensity column. 'Amt' points to the Amount/Dose (kcal/wk) column. 'Freq' points to the Amount/Dose (min per wk) column.

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STRRIDE II - Training Protocols

<u>Protocol</u>	<u>Intensity</u>	<u>Amount</u>	<u>Frequency</u>
AT	65-80% VO ₂	1300kcal	3x per wk
RT	3 reps of	12-15 reps	3x per wk
AT/RT	combination	AT/RT	3-5x per wk
High AT	65-80% VO ₂	2200kcal	3x per wk

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STRRIDE - Training Protocols

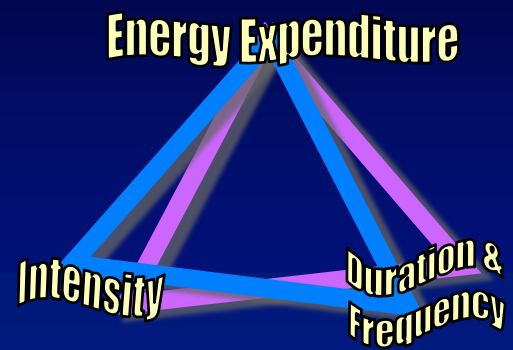
<u>Intensity</u> <u>Loss</u> (peak VO ₂)	<u>Amount</u> (kcal/wk)	<u>Presc Wt.</u>
Brisk Walking	16 miles/week	None
Jogging	16 miles/week	None
Brisk Walking	10 miles/week	None
DPP Program	10 miles/week	7% ← Diet

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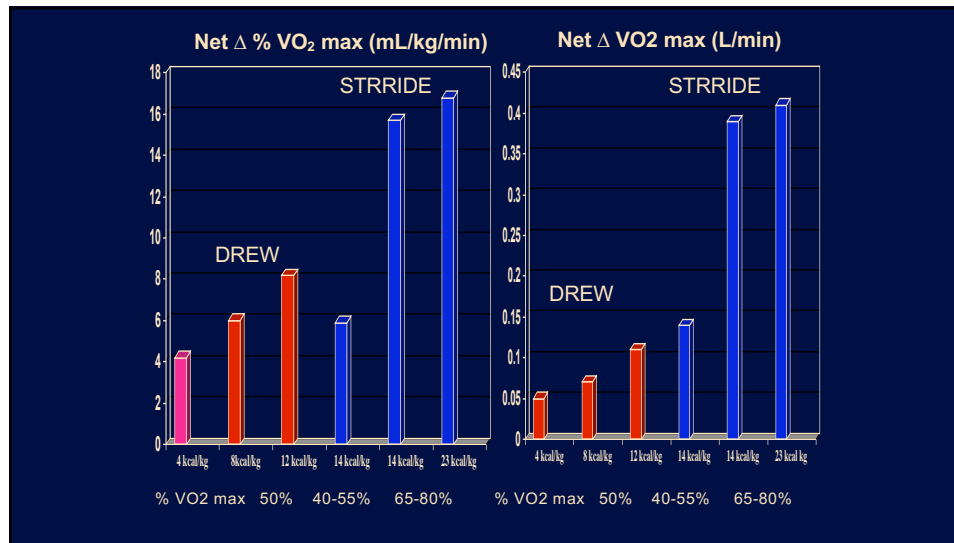
Considerations (2)

The Gender Issue

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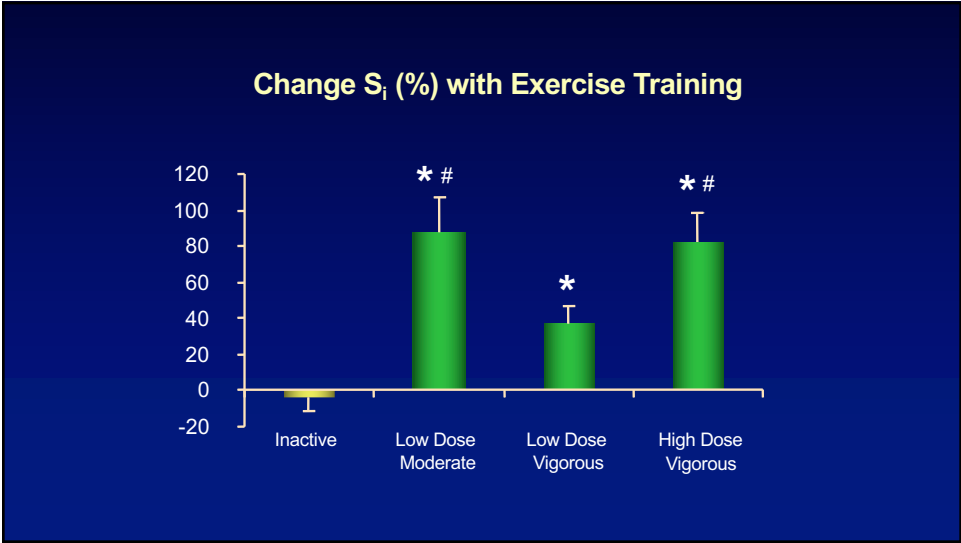


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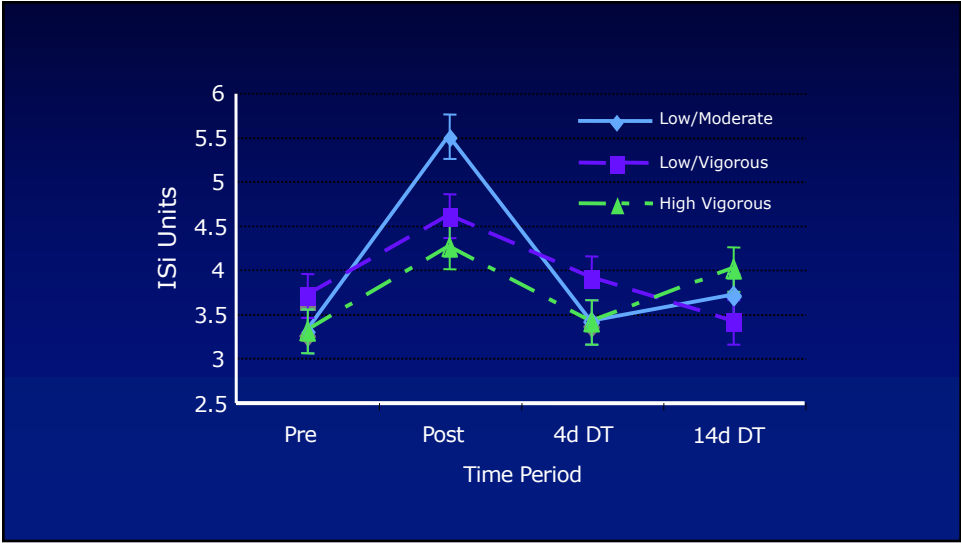
Considerations (3)

What to Measure When
Relative to the Last
Training Bout

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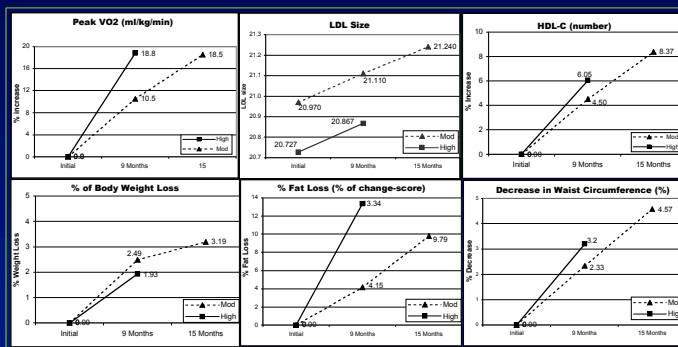


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Comparison of High Amount Vigorous at 9 months to Low Amount Vigorous Exercise at 15 months



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A Few Words about MoTrPAC

- Big Science
- Collaborations
- Work in Progress

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Pilot Studies

- Utility cannot be overemphasized
- To show feasibility
- Provide preliminary data for application
- Provide estimate of statistical power
- Point out logistical challenges
- Give the study group confidence

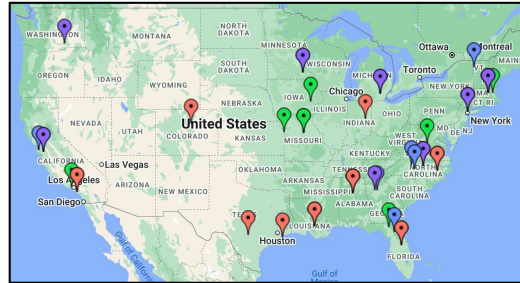
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Working as a Collaborative -- MoTrPAC



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MoTrPAC Team



Human Clinical Centers

1. ExPACT - Ball State/Alabama/Florida
2. U of Colorado - Denver
3. Duke/East Carolina University
4. Texas (San Antonio and UTMB)
5. Pennington Biomedical Research Center
6. U of California - Irvine (Pediatric Center)

Coordinating Center - U of Florida, Wake Forest,

U of Vermont

Bioinformatics Data Center - Stanford

Chemical Analysis Sites - Broad, Duke, Emory,
Georgia Tech, Mayo Clinic, Michigan, Mount Sinai,
Stanford, Pacific Northwest National Lab

Animal Sites - Iowa, Florida, Harvard, UCLA,
Virginia, Kansas Med Center, Missouri

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Reunion Slides

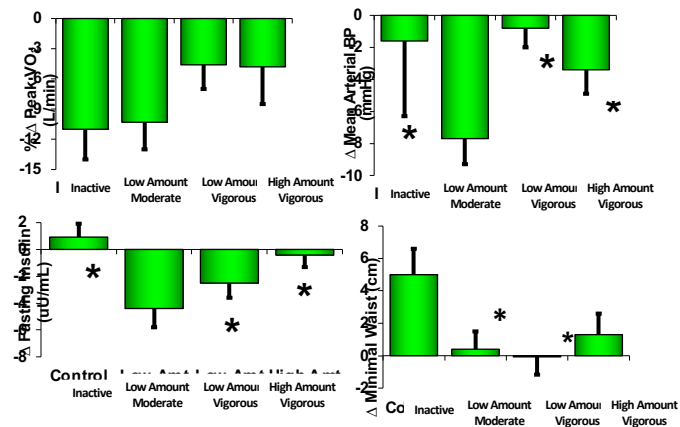
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Reunion Protocol

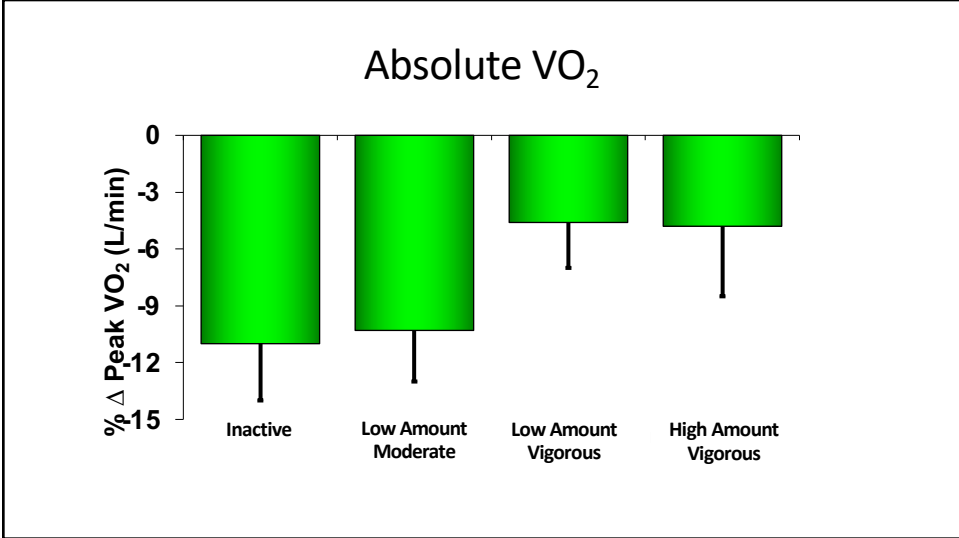
- STRRIDE I participants that finished intervention period—drop-outs not invited back.
- 10 years following completion invited back for CPX test, blood work, assessment of BP, lipids, FBG, FI, waist circumference and weight, PA in last three months.
- Comparisons made to pre-intervention assessments.

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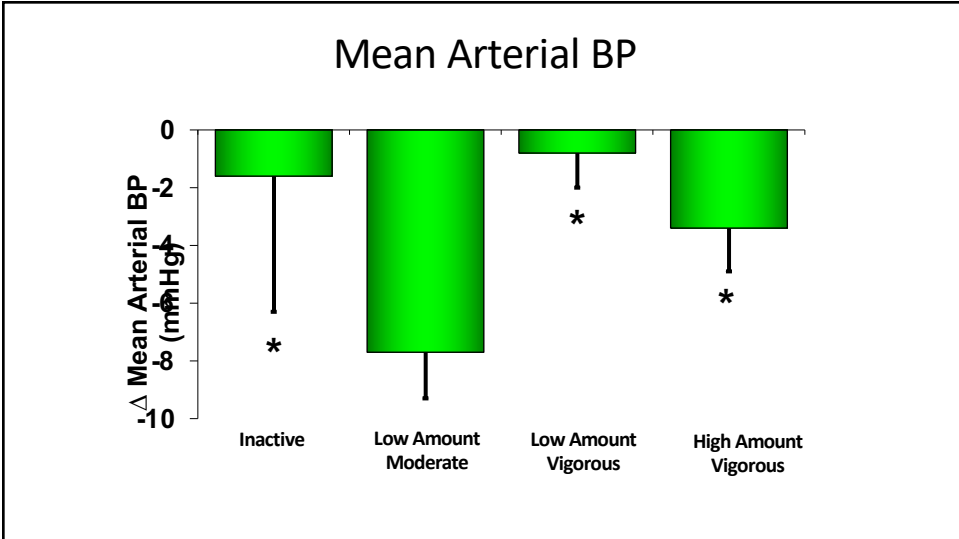
Reunion Results



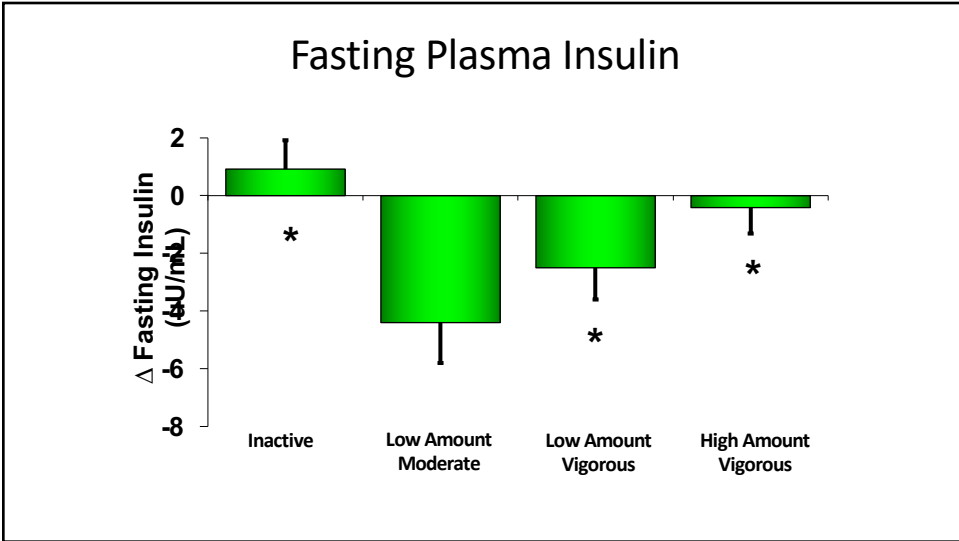
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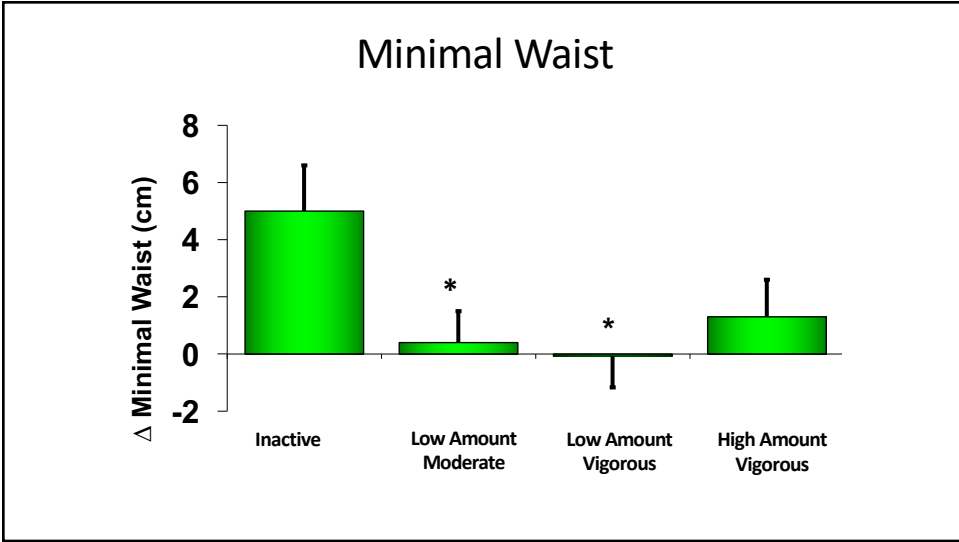
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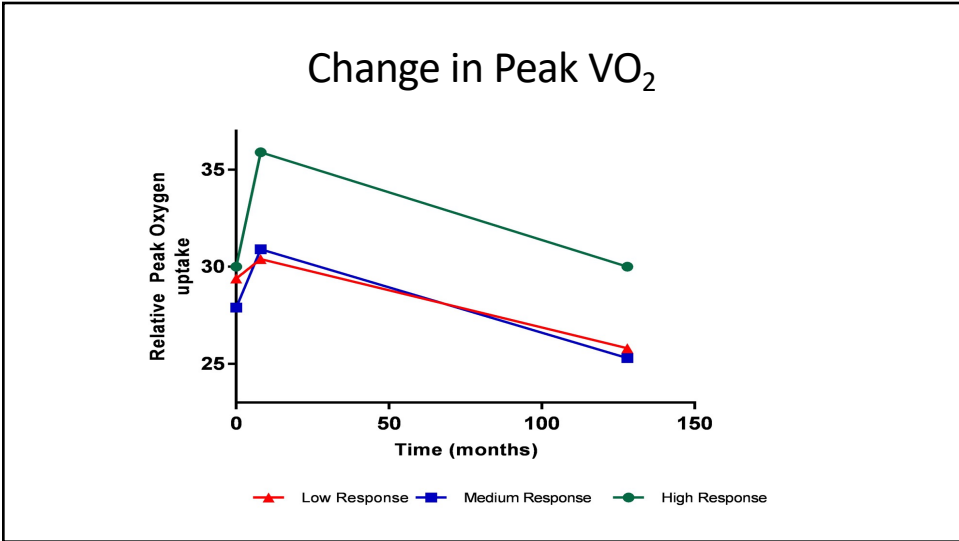
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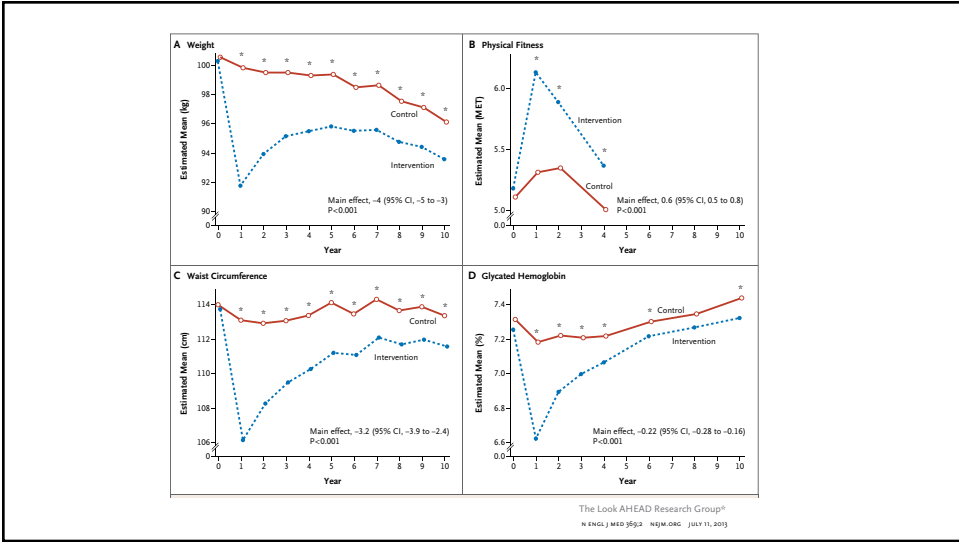
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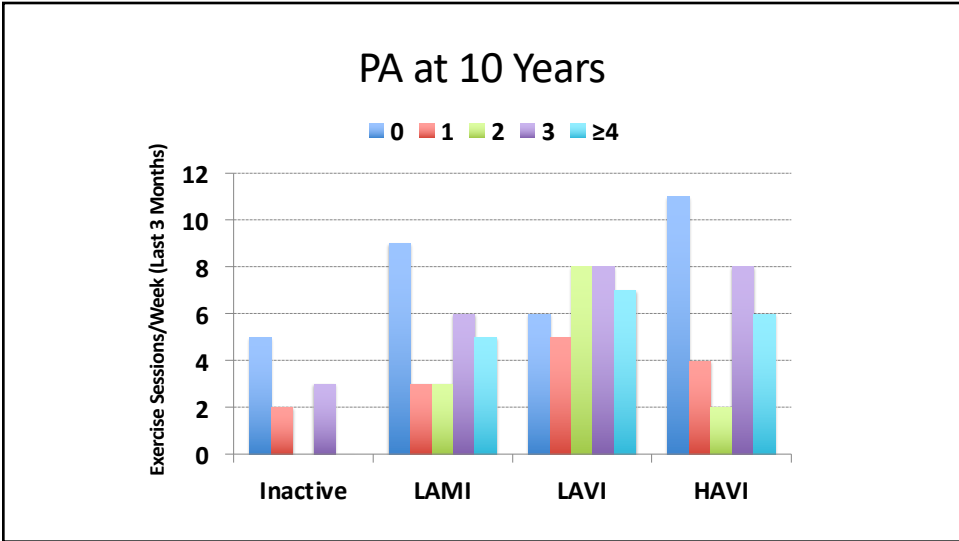
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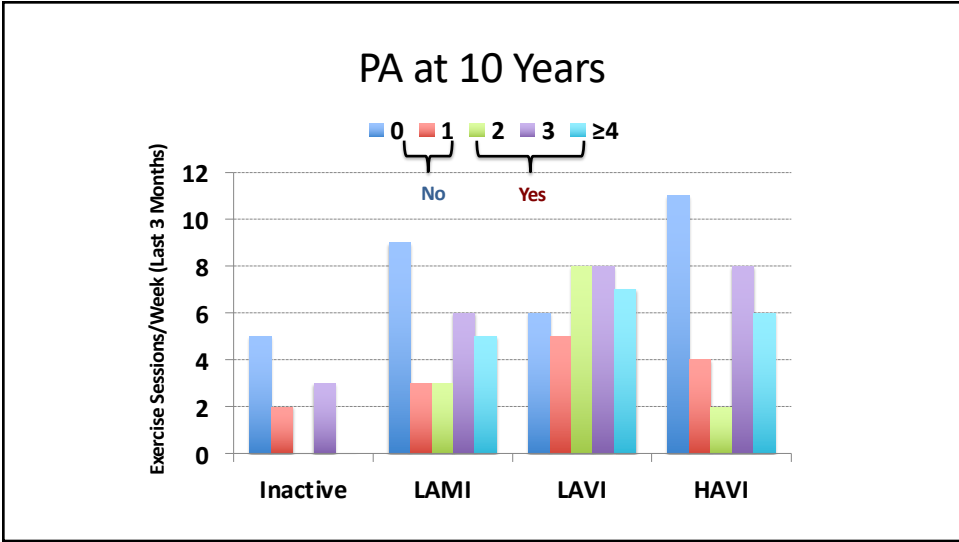
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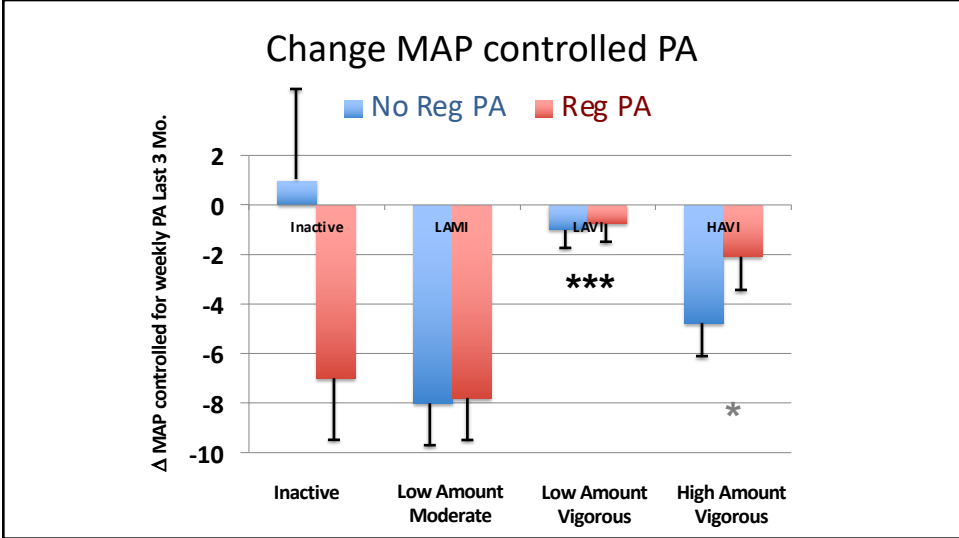
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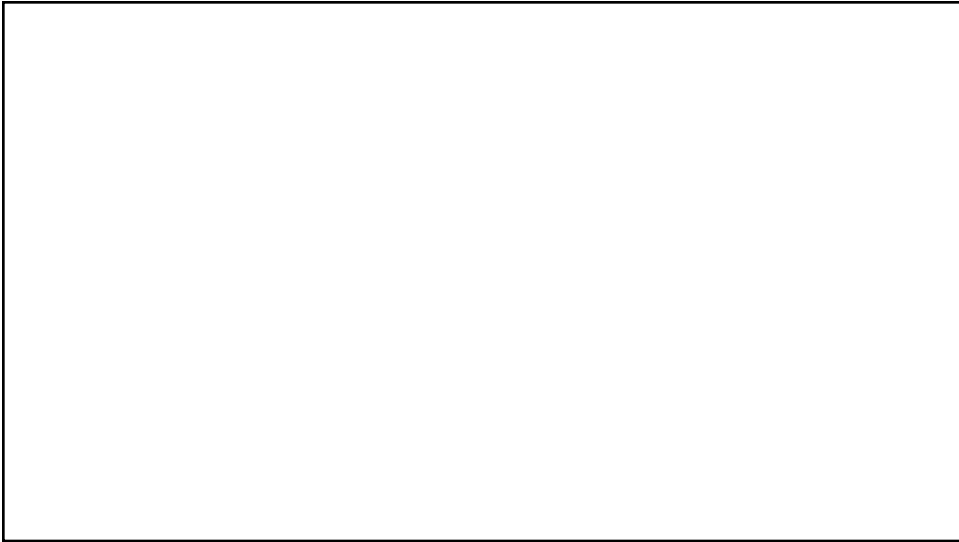
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(Additional) Questions?