

# Optimizing Diet & Exercise Changes in Chronically Stressed Adults: Major Results of the CALM Trial

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# Background

- *Healthful nutrition and physical activity (PA) patterns are key health behaviors that a large % of adults find challenging to do*
- *Especially difficult for adults with **chronic time constraints and demands***
- *Little evidence concerning how best to **combine** diet & PA interventions to optimize both behaviors in adults not at recommended levels*

## MAJOR OBJECTIVE

- Conduct RCT comparing *Timing* of Diet & PA program delivery in facilitating early (4 mos) & longer-term (12 mos) change in each behavior
- **Simultaneous vs. Sequential** program delivery

# Eligibility Requirements

- Men and Women aged 45 years and older
- Rated  $> 2$  on 4-item Cohen Perceived Stress Scale
- Free of CVD, stroke, severe orthopedic problems
- Consuming  $> 10\%$  total calories from saturated fats and  $< 5$  servings/day of vegetables & fruits
- Engaged in  $< 60$  mins/wk of Moderate or more vigorous PA (MVPA)
- Willing to participate in a telephone-based program
- Willing to be randomly assigned

200 Eligible Adults randomized to 12 mos of:

Attention-  
Control  
(stress  
management)

Exercise 1st,  
(4 mos)  
Then Diet  
Added

Diet 1st,  
(4 mos)  
Then Exercise  
Added

Simultaneous  
Diet + Exercise  
Across  
12 mos



Primary Assessments at baseline, 4 months & 12 months

## CALM Interventions - Overview

- All interventions based on behavioral theory  
(Social cognitive theory, Transtheoretical Model)
- 12-month Interventions
- *Physical Activity:*  
Goal: 150+ mins/wk in moderate-intensity+  
PA (brisk walking)
- *Dietary Intake:*  
Goals: 5+ servings/day of fruits & vegetables  
< 10 % of total calories from saturated fats

# CALM Interventions

- All arms based on *Active Choices Telephone format* (1 initial face-to-face instructional session + series of calls)
- *Matched Staff Phone Contacts:*
  - 15 calls included PA
  - 15 calls included Nutrition
  - Sequential = 15-20 min; Simultaneous = 30-40 min

## CALM CALL SCHEDULE

	EXERCISE 1ST (1)			NUTRITION 1ST (2)			SIMULTANEOUS (3)			STRESS MGMT. (4)	
	CALL	EXERCISE	NUTRITION	CALL	EXERCISE	NUTRITION	CALL	EXERCISE	NUTRITION	CALL	S.M.
Week 2	1	15-20		1		15-20	1	30-40		1	30-40
Week 4	2	15-20		2		15-20	2	30-40		2	30-40
Week 6	3	15-20		3		15-20	3	30-40		3	30-40
Week 8	4	15-20		4		15-20	4	30-40		4	30-40
Week 10							5	30-40		5	30-40
Week 12	5	15-20		5		15-20					
Week 14							6	30-40		6	30-40
Week 16	6	15-20		6		15-20					
Week 18	7	15-20	nutrition only	7	exercise only	15-20	7	30-40		7	30-40
Week 20	8	30-40		8		30-40					
Week 22	9	30-40	booster	9	booster	15-20	8	30-40		8	30-40
Week 24	10	30-40		10		30-40					
Week 26	11	15-20	booster	11	booster	15-20	9	30-40		9	30-40
Week 28	12	30-40		12		30-40					
Week 30	13	15-20	booster	13	booster	15-20	10	30-40		10	30-40
Week 32	14	30-40		14		30-40					
Week 34	15	15-20	booster	15	booster	15-20	11	30-40		11	30-40
Week 36	16	30-40		16		30-40					
Week 38	17	15-20	booster	17	booster	15-20	12	30-40		12	30-40
Week 40	18	30-40		18		30-40					
Week 42	19	30-40		19		30-40	13	30-40		13	30-40
Week 44											
Week 46	20	30-40		20		30-40	14	30-40		14	30-40
Week 48											
Week 50	21	30-40		21		30-40	15	30-40		15	30-40

450-600 min

15 ex calls

15 nutr calls

450-600 min

15 ex calls

15 nutr calls

450-600 min

15 ex/nut calls

450-600 min

15 SM calls

# CALM Interventions, cont.

## *Phone-based Stress Management Control*

### Skill-building in stress management areas:

- deep breathing exercises
- progressive muscle relaxation
- guided visualization
- pleasant events scheduling
- sleep hygiene
- time management

# Dependent Measures

## *Physical Activity*

- 7-Day Physical Activity Recall (point-prevalence)
- CHAMPS questionnaire (usual activities over a typical week in the past month)
- To increase measurement stability, both measures converted to z scores & averaged

## *Nutrition*

- Block Food Frequency Questionnaire

## SAMPLE DESCRIPTION (n = 200)

- Age (yrs): 55.3 (range = 46 - 82 yrs)
- 50% women
- 30% from Ethnic minority groups
- 19% Family Caregivers
- 18.8 Years of Education (range 10-18)
- 78% Employed
- 4 and 12-month data collected on > 93%

## 4 & 12 mo. DATA ANALYSES

- Intent-to-treat (imputed baseline for missing data)
- Analysis of Covariance
  - Baseline value as covariate
  - Main effects: group assignment, gender, caregiver status

*Turning to the RESULTS . . .*

# Significant Changes in *DIETARY Behaviors* relative to Control ( $p \leq .05$ , Intent-to-treat)

	PA-1 <sup>st</sup>	Diet-1 <sup>st</sup>	Simult
<i>Fruits &amp; Veggies</i> (servings)			
4 mo:	---	↑ *	↑ *
12 mo:	↑	↑	↑
<i>Saturated Fat</i> (% Cals)			
4 mo:	---	↓ *	↓ *
12 mo:	↓	↓	↓

\* Also improvement vs. PA-1<sup>st</sup> = .0009

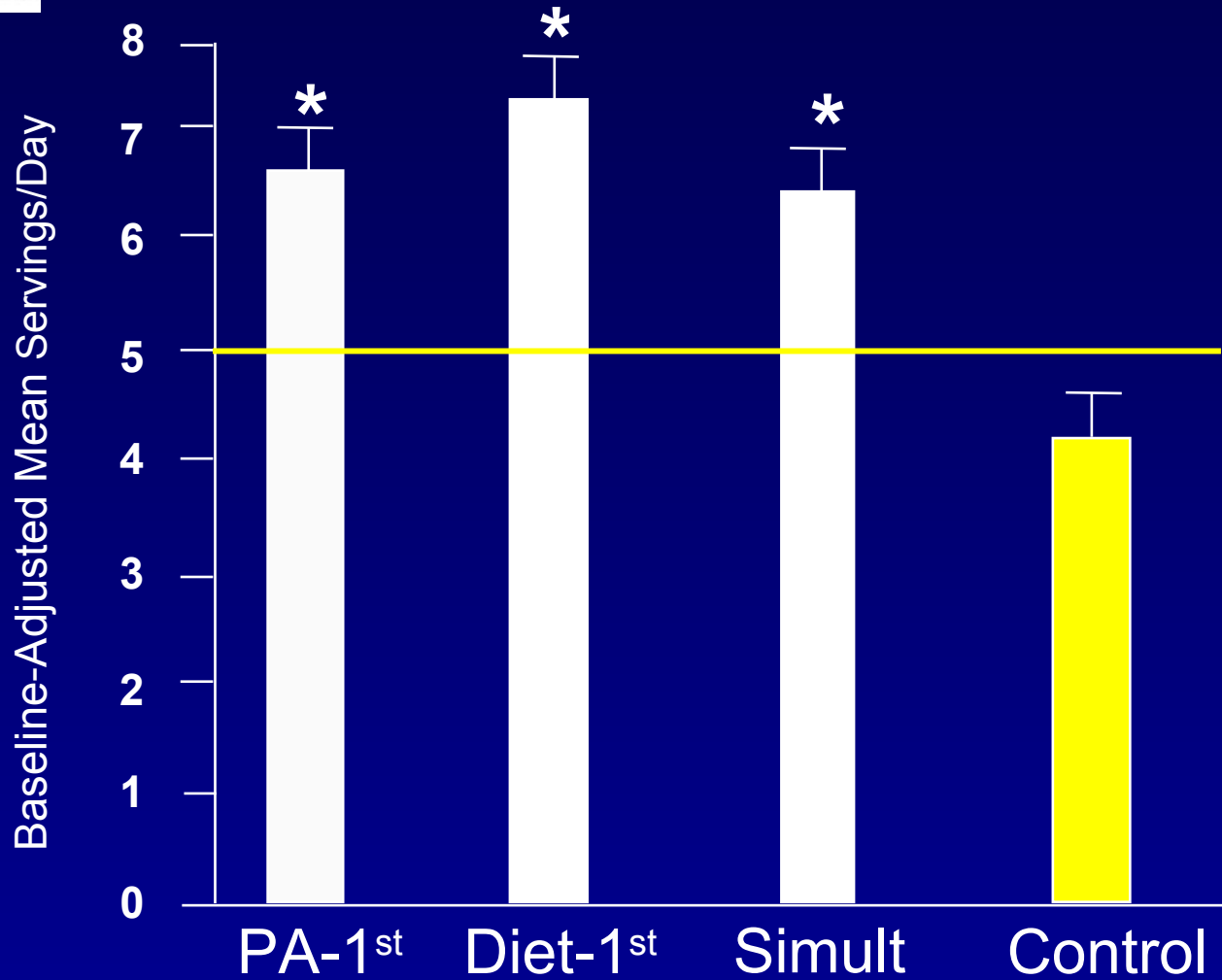
# Significant Changes in *PA Behavior* relative to Control ( $p < .02$ ; Intent-to-treat)

	PA-1 <sup>st</sup>	Diet-1 <sup>st</sup>	Simult
<i>Mins/wk in MVPA</i>			
4 mo:	↑* †	---	---
12 mo:	↑	---	↑

\* Sig. Improvement vs. *Diet-1<sup>st</sup>* = .001;

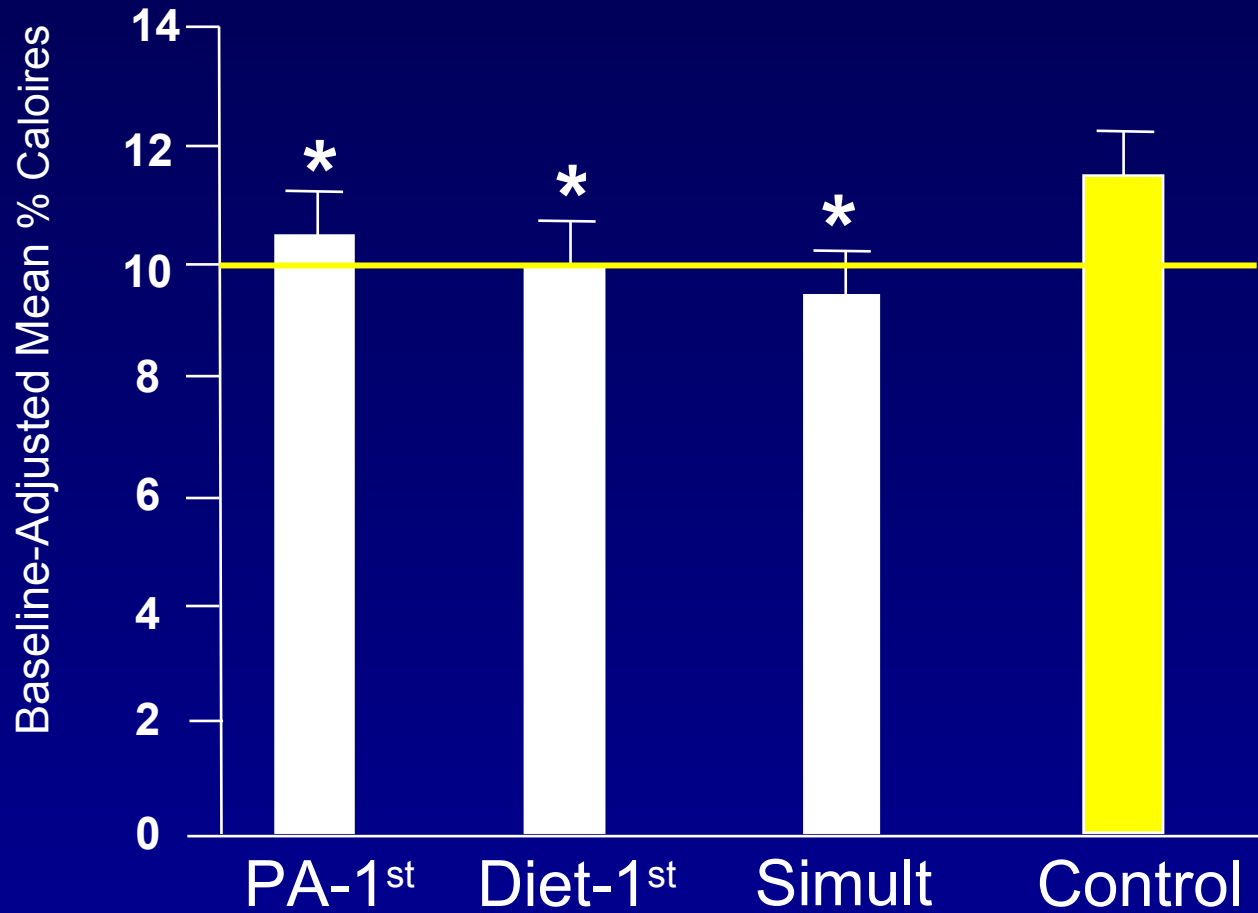
† Sig. Improvement vs. *Simultaneous* = .04

# 12-Month Fruits & Vegetables/Day



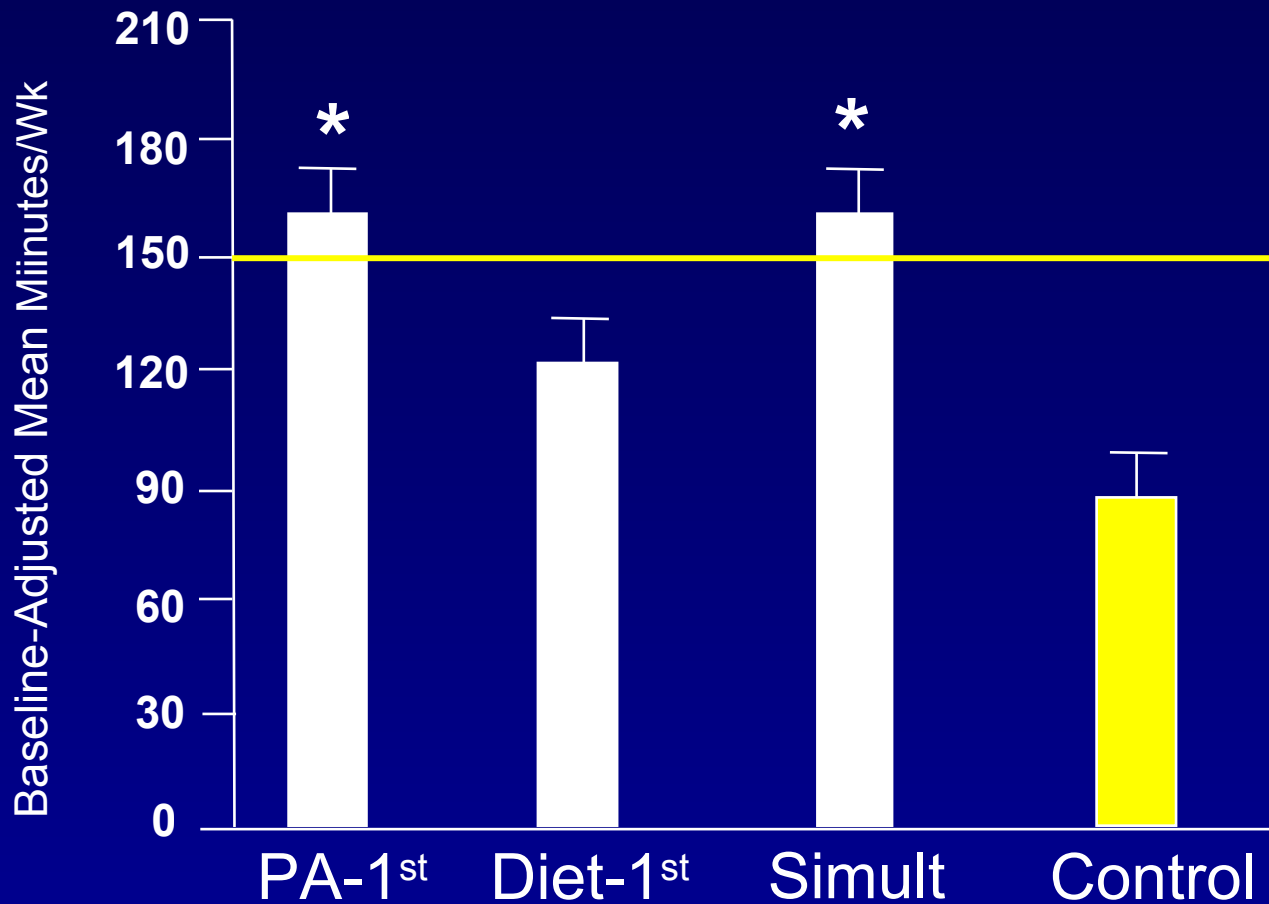
\*  $p \leq .0004$  vs. Control

# 12-Month % Calories from Saturated Fat



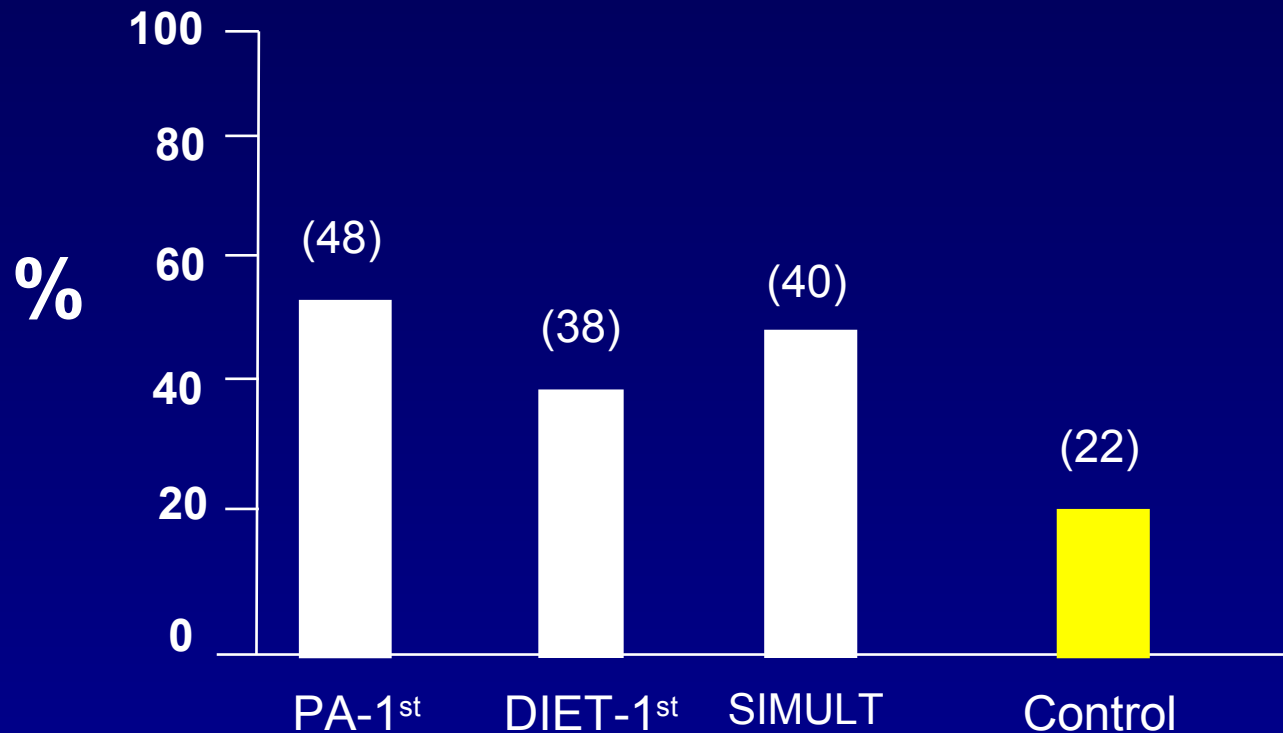
\*  $p \leq .05$  vs. Control

# 12-Month MVPA Minutes/Week (mean of PAR&CHAMPS)



\*  $P < .02$  vs. Control

## % Reaching National Recommendation\* at 12 Months (mean PAR&CHAMPS)



\*  $\geq 150$  mins/wk in Moderate activities

Control different from PA-1<sup>st</sup> at  $P = 0.01$

# CONCLUSIONS

- *Timing* of intervention delivery (sequential vs. simultaneous) may *differentially impact* these 2 health behaviors

**DIET:** All 3 interventions demonstrated F&V and saturated fat improvements by 12 months

**PA:** PA-1st did well at 4 & 12 months  
*Simultaneous* improved by 12 months  
but...starting with Diet-1st may not be optimal way to promote PA change

# FUTURE DIRECTIONS

- Explore possible *Mediators* of intervention effects e.g., why easier to go from *PA to dietary change* as opposed to the opposite? (*theory building & refinement*)
- Exploring possible *Moderators* (i.e., *subgroups* who do better or worse with Sequential vs. Simultaneous interventions)
- Explore impacts of interventions on *well-being, QOL, BMI & related outcomes*

***Thank you!***

