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Survivorship: Lifestyle Modifications of Diet and Exercise

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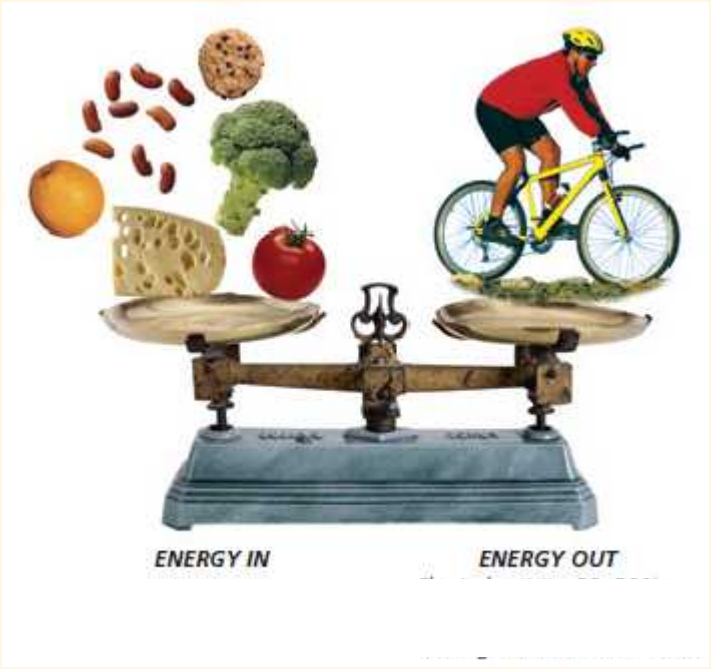
To Win We Have To Lose



Functional Limitations

- Compared to age and gender matched non-cancer controls:
  - Peak cardiorespiratory fitness is similar to the 20th percentile
  - ~20% lower strength
  - Recent and long-term (5+ years) more likely to report difficulties
    - ~50% report physical limitations (vs. 21%)
    - ~33% reported participation restrictions (vs. 13%)

Burnett D, et al. Springerplus 2013, Simonavice E, et al. Healthcare 2015; Sweeney et al. J Natl Cancer Inst 2006; Ness et al. Ann Epidemiol 2006

Metabolic Abnormalities

- Weight gain is more common in patients:
  - Receiving chemo-, steroid, or hormonal therapy
  - Premenopausal women (for breast cancer)
- Sarcopenia is common in cancer survivors
- Compared to age-matched non-cancer controls, cancer survivors more likely to have T2DM and CVD risk factors

Is metabolic risk greater in cancer survivors than adults without a cancer history if matched for BMI?

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Original Report:
Public Health

Insulin Resistance and Inflammation in Black Women with and without Breast Cancer: Cause for Concern

Kathleen A. Griffith, PhD, MPH, CRNP[1]; Seon-Yoon Chung, PLD, RN[1];
Shijun Zhu, PhD[1]; Alice S. Ryan, PhD[2,3]

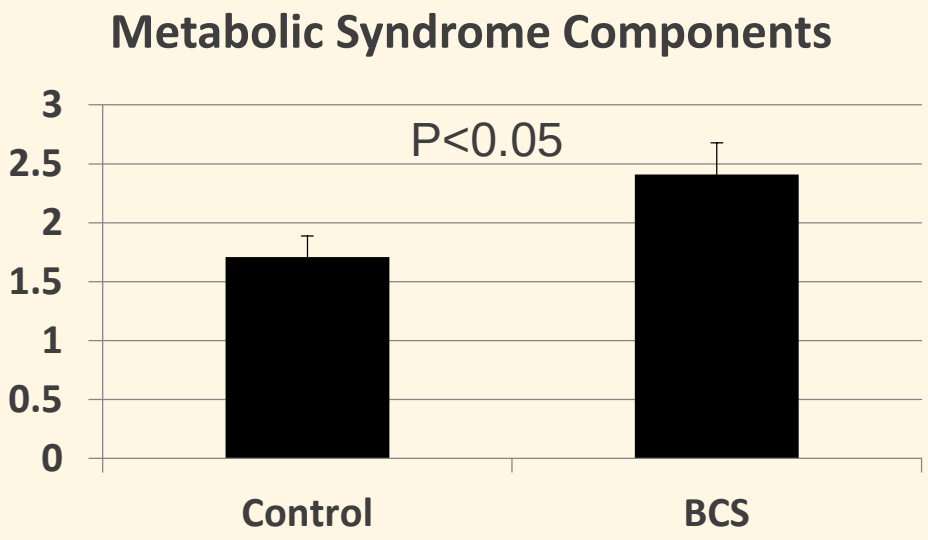
Table 2. Comparisons on measures of insulin resistance, inflammation and lipids between women with and without breast cancer

Biomarker	Breast cancer		No Cancer					
	n=19		Similar age, n=25			Older, n=32		
	Mean	SD	Mean	SD	P	Mean	SD	P
Glucose, mmol/L	5.78	.84	5.27	.74	.042	5.16	.81	.012
Insulin, μIU/mL[a]	23.4	10.8	15.4	9.9	.001	14.3	7.6	<.001
HOMA-IR[a]	6.0	2.9	3.6	3.1	.001	3.2	1.4	<.001
C reactive protein, mg/dL	8.32	6.90	7.80	6.43	.826	5.09	6.09	.140
IL-1b, pg/mL	2.1	.7	1.1	.9	.001	1.1	.8	<.001
IL-6, pg/mL[a]	6.8	3.6	4.3	3.6	.007	6.7	8.1	.120
IL-8, pg/mL[a]	9.8	5.1	13.1	24.0	.245	10.4	24.2	.018
TNF-α, pg/mL	18.3	5.3	7.8	3.5	<.001	6.8	3.7	<.001
Triglycerides, mg/dL	99.9	58.6	94.7	31.3	.739	114.7	42.9	.324
Total cholesterol, mg/dL	184.4	23.5	189.5	31.0	.580	192.1	31.0	.372
HDL cholesterol, mg/dL	54.5	11.7	56.5	14.9	.669	48.9	9.5	.081
LDL cholesterol, mg/dL	109.5	26.7	114.4	27.8	.594	119.8	27.3	.217
Adiponectin, μg/mL	12.9	8.4, n=17	19.3	9.9, n=11	.082	13.2	9.2, n=9	.938

Comparisons made to BC group using t-tests. Associated P values are reported.
a. Indicates variable transformed for analysis.

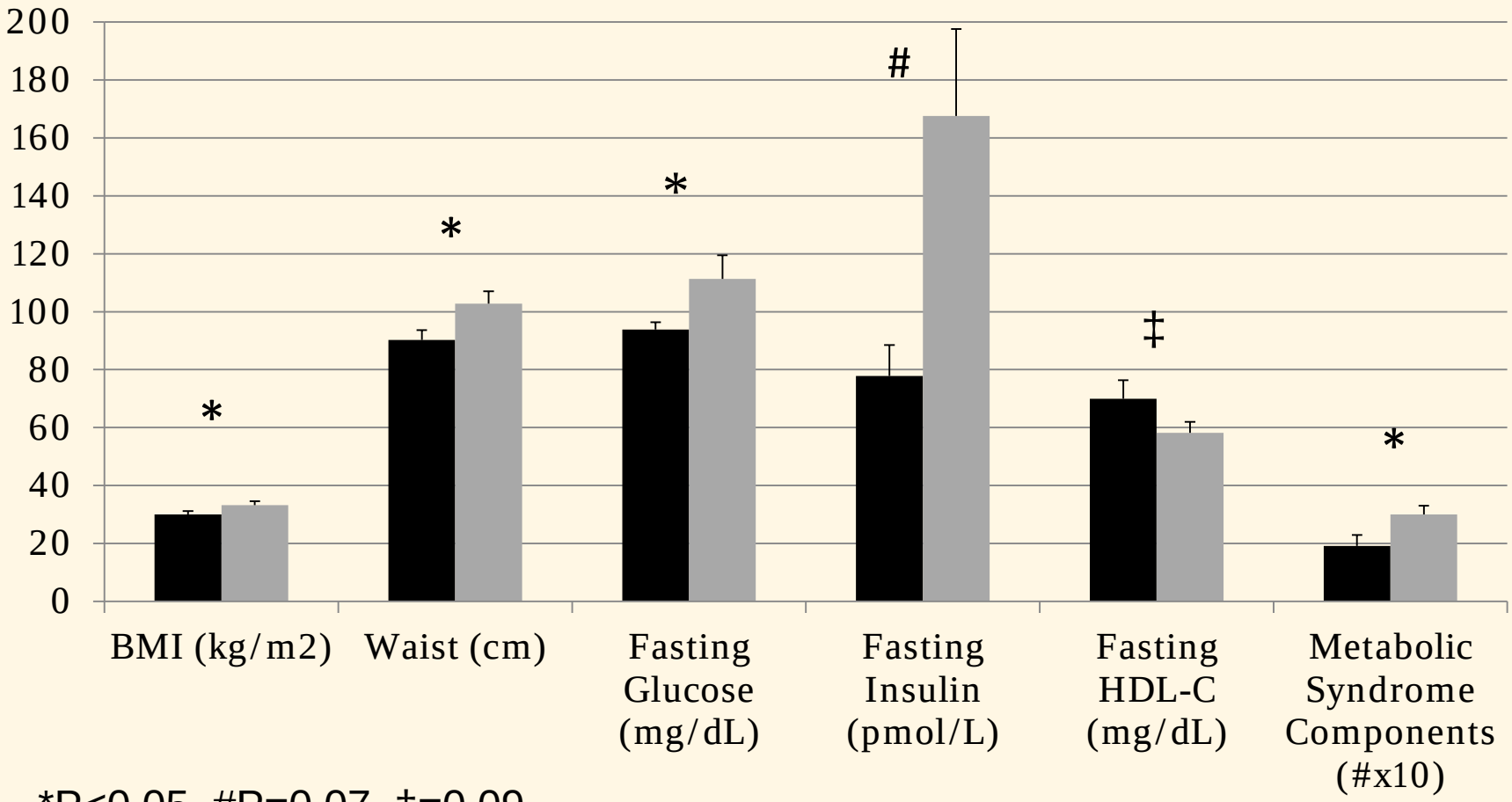
Metabolic Syndrome

- BCS are ~2.5x more likely to have Metabolic Syndrome (21% vs. 52%, P<0.05)
- Blood pressure (64%) and waist circumference (61%) were the most prevalent components



Serra, Goldberg & Ryan. Diabetolgoy & Metabolic Syndrome 2016

Depression associated with worse metabolic profiles



*P<0.05, #P=0.07, ‡=0.09

Support Care Cancer (2016) 24:1875–1881
DOI 10.1007/s00520-015-2984-2

ORIGINAL ARTICLE

Weight loss with mindful eating in African American women following treatment for breast cancer: a longitudinal study

SeonYoon Chung[1] · Shijun Zhu[1] · Erika Friedmann[1] · Catherine Kelleher[1] · Adriane Kozlovsky[2,3] · Karen W. Macfarlane[4] · Katherine H. R. Tkaczuk[5] · Alice S. Ryan[2,3] · Kathleen A. Griffith[1]

Table 2 Changes in mindful eating assessment, weight, and BMI over time in African American women with treatment of breast cancer who participated in mindfulness eating intervention program for 6 months (N=22)

Characteristic	Baseline		Post-3 months		Post-6 months		β	Sig.
	Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)		
MEQ	2.18–3.98	2.87 (0.400)	2.28–3.64	2.90 (0.44)	2.46–3.98	3.03 (0.405)	0.160	.001
Weight (kg)	59.87–142.30	92.44 (16.05)	59.87–136.26	91.53 (16.14)	63.59–142.30	92.00 (16.90)	−0.887	.015
BMI (kg/m^2)	27.08–47.21	35.13 (3.97)	25.10–47.75	34.30 (4.27)	26.66–49.87	34.47 (4.59)	−0.331	.014

Mindful Eating Questionnaire (MEQ) assessing mindful eating; score range is 1–4, higher is more mindful

BMI body mass index

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Exercise Guidelines for Individuals with Cancer (ACSM 2018)

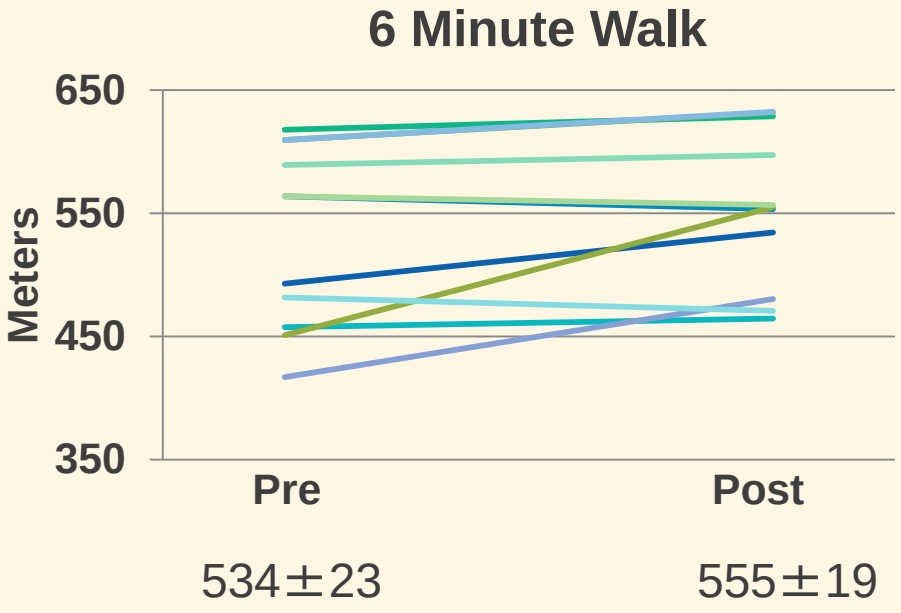
	Aerobic	Resistance	Flexibility
Frequency	3-5 d/wk	2-3 d/wk	≥2-3 d/wk with daily being most effective
Intensity	Moderate (64-75% HR_{max}) to vigorous (76-95% HR_{max})	Start with low resistance (e.g.,<30% of 1-RM) and progress with smallest increments possible	Move through ROM as tolerated
Time	75 min/wk of vigorous intensity or 150 min/wk of moderate intensity activity or an equivalent combination of the two	At least 1 set of 8-12 repetitions	10-30 s hold for static stretching
Type	Prolonged, rhythmic activities using large muscle groups	Free weights, resistance machines, or weight-bearing functional tasks targeting all major muscle groups	Stretching or ROM exercises for all major muscle groups. Address specific areas of joint or muscle restriction that may have resulted from treatment with steroids, radiation, or surgery.

Exercise has modest positive effects on:

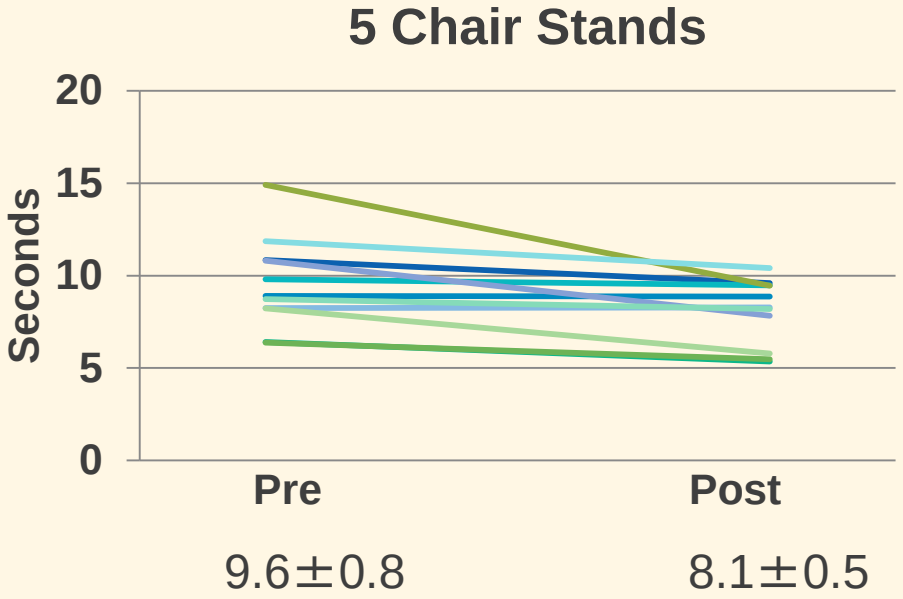
- 66 studies considered to be of high methodological quality ⟶
- Better outcomes with post-treatment vs. during treatment exercise (+ +++)
- Psychological Stress
  - Anxiety: ~15 studies: +
  - Pain: ~10 studies: +
  - QOL: ~25 studies; +
  - Depressive Symptoms: ~20 studies: ++
  - Fatigue: ~30 studies; +++
- Muscle Mass and Function
  - Lean Mass- ~10 studies; +
  - Aerobic fitness- ~25 studies; ++
  - Strength- ~15 studies; +++

Muscle Function

- 25-30% improvement in muscle strength



↑4%, P=0.09

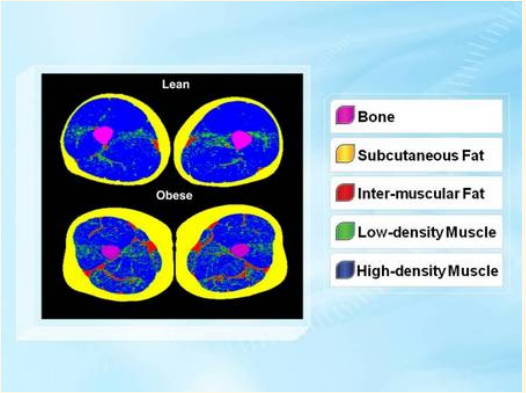


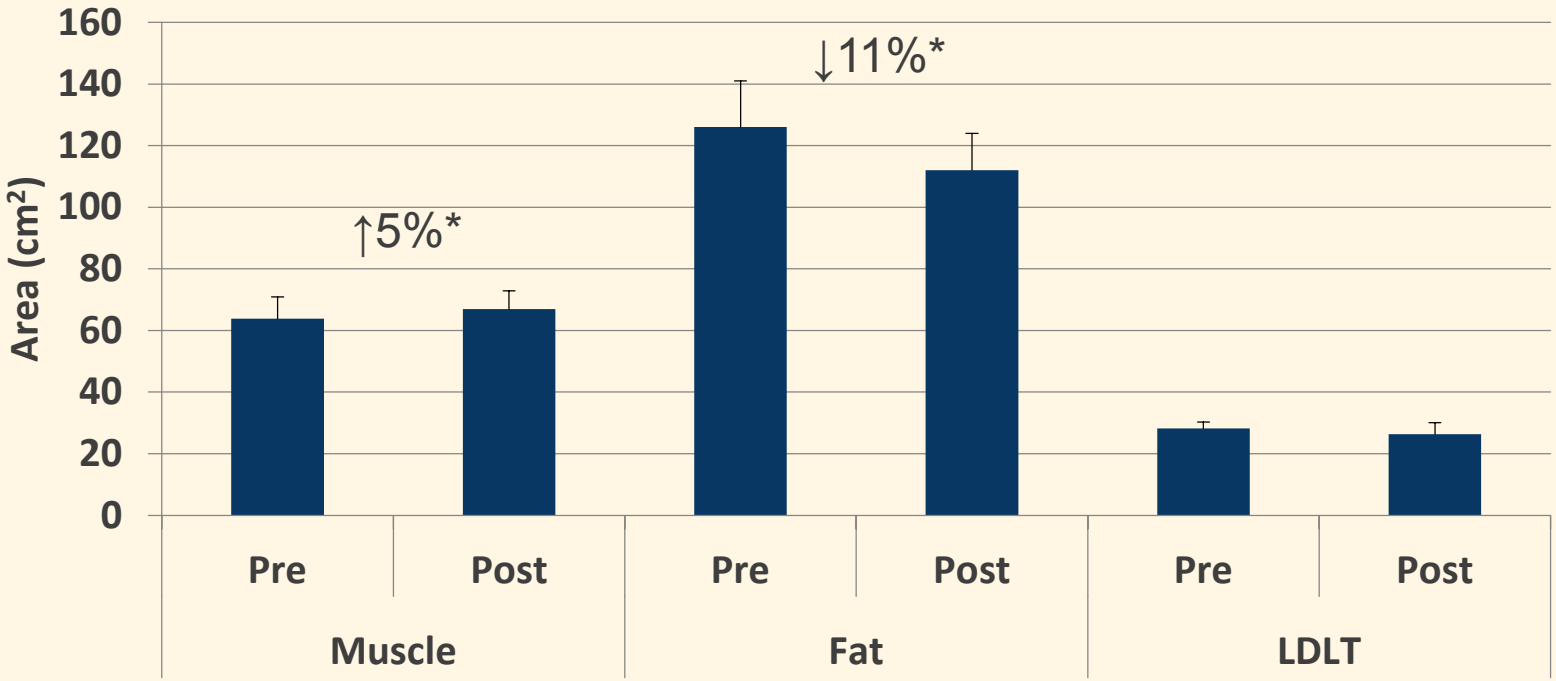
↓16%, P<0.01

Serra, Ryan et. al. Menopause 2018

Mid-thigh Area

- Thigh muscle area increased and fat area decreased



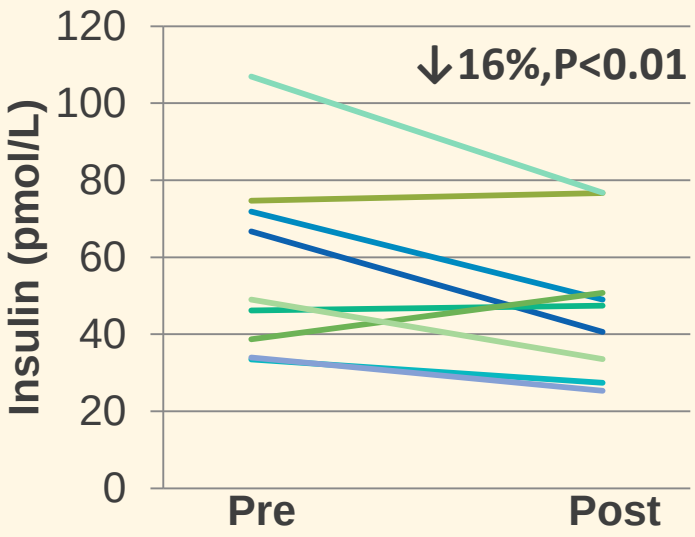


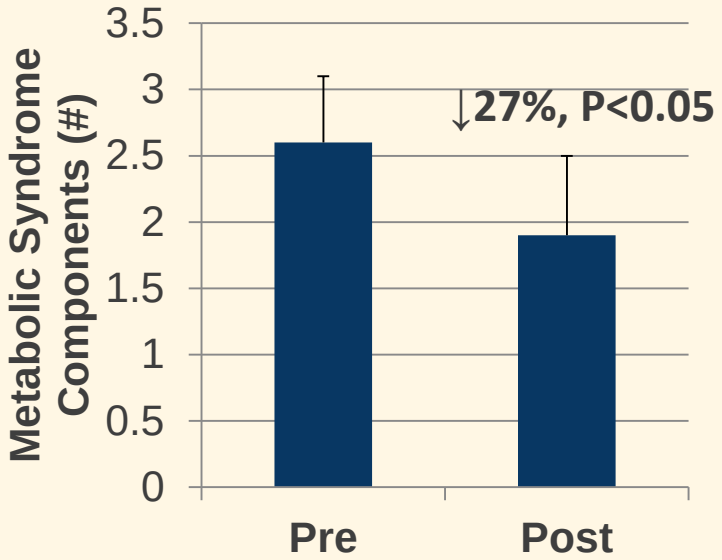
*P<0.05

Serra, Ryan et. al. Menopause 2018

Metabolic Status

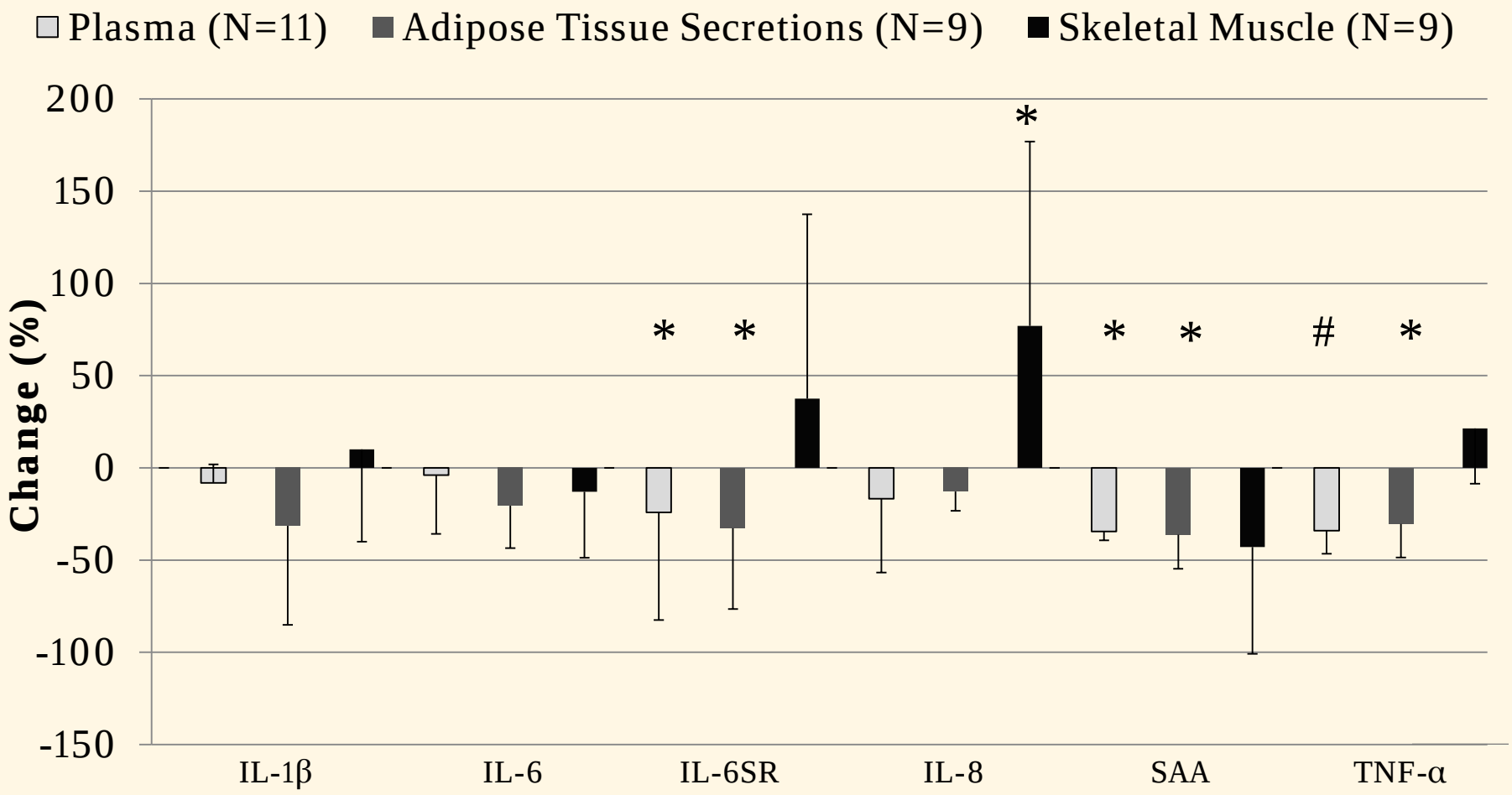
No changes in fasting or 2-hr glucose or lipid profiles





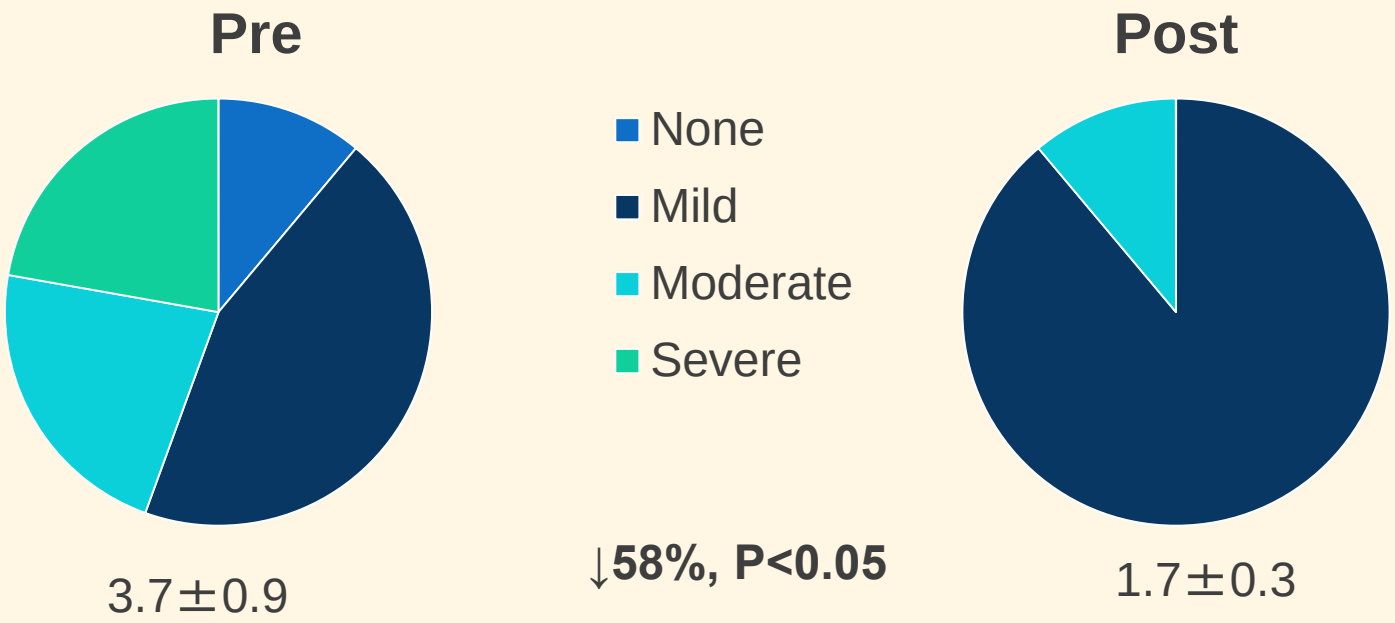
Serra, Ryan et. al. Menopause 2018

Inflammation



Serra, Ryan et. al. Menopause 2018

Piper Fatigue Index



Δ associated with initial: r=-0.96, P<0.01

Physical Activity and Survival

- Survivors achieving weekly activity recommendations

pre-diagnosis:

- Reduced Risk of Developing Cancer
  - 20-40%
- Reduced All-cause Mortality Risk
- 15-20%

Survivors and Physical Activity

- Benefits: Weight Gain and QOL
  - Reduce Risk of Cancer Recurrence
  - Improve Survival

Exercise Effect on Chemotherapy-Induced Neuropathic Pain, Peripheral Nerve Fibers

Determine the effects of aerobic exercise and resistive training versus attention control on CIPN and peripheral sensory fiber density in cancer survivors who have completed chemotherapy. 5R21HD091696-02 (Ryan/Griffith)

Progressive Activity-Based Rehabilitation in Veteran Cancer Survivors with Chronic Pain

VA SPiRE (Ryan/Griffith)

ACKNOWLEDGEMENTS

Monica Serra, PhD
Heidi Ortmeyer, PhD
Andrew Goldberg, MD
Kathleen Griffith, PhD, FNP-BC
SeonYoon Chung, PhD
Shijun Zhu, PhD
Katherine Tkaczuk, MD

NIH/National Institute of Aging
NIH/NIA: U of MD OAIC
NIH/NIDDK: Mid-Atlantic NORC
VA/ RR&D
VA GRECC