

Daniel J. Lee-Hassett¹, Rebekah L. Wilson^{1,2}, Amber J. Normann^{1,3}, Cami N. Christopher^{1,4}, Mary K. Norris¹, Christina M. Dieli-Conwright^{1,2,4}
1. Dana-Farber Cancer Institute, 2. Harvard Medical School, 3. Boston University, 4. Harvard T.H Chan School of Public Health

INTRODUCTION

- For adults diagnosed with breast, prostate and colorectal cancer, treatment options such as chemotherapy often induce muscle weakness. These patients also tend to lead more sedentary lives due to their diagnoses and treatments, leading to further losses in muscular strength (Figure 1).
- Exercise, specifically aerobic and resistance exercise, has been shown to increase muscular strength, which reduces the risk of cancer mortality and improves quality of life in cancer survivors (Figure 2).

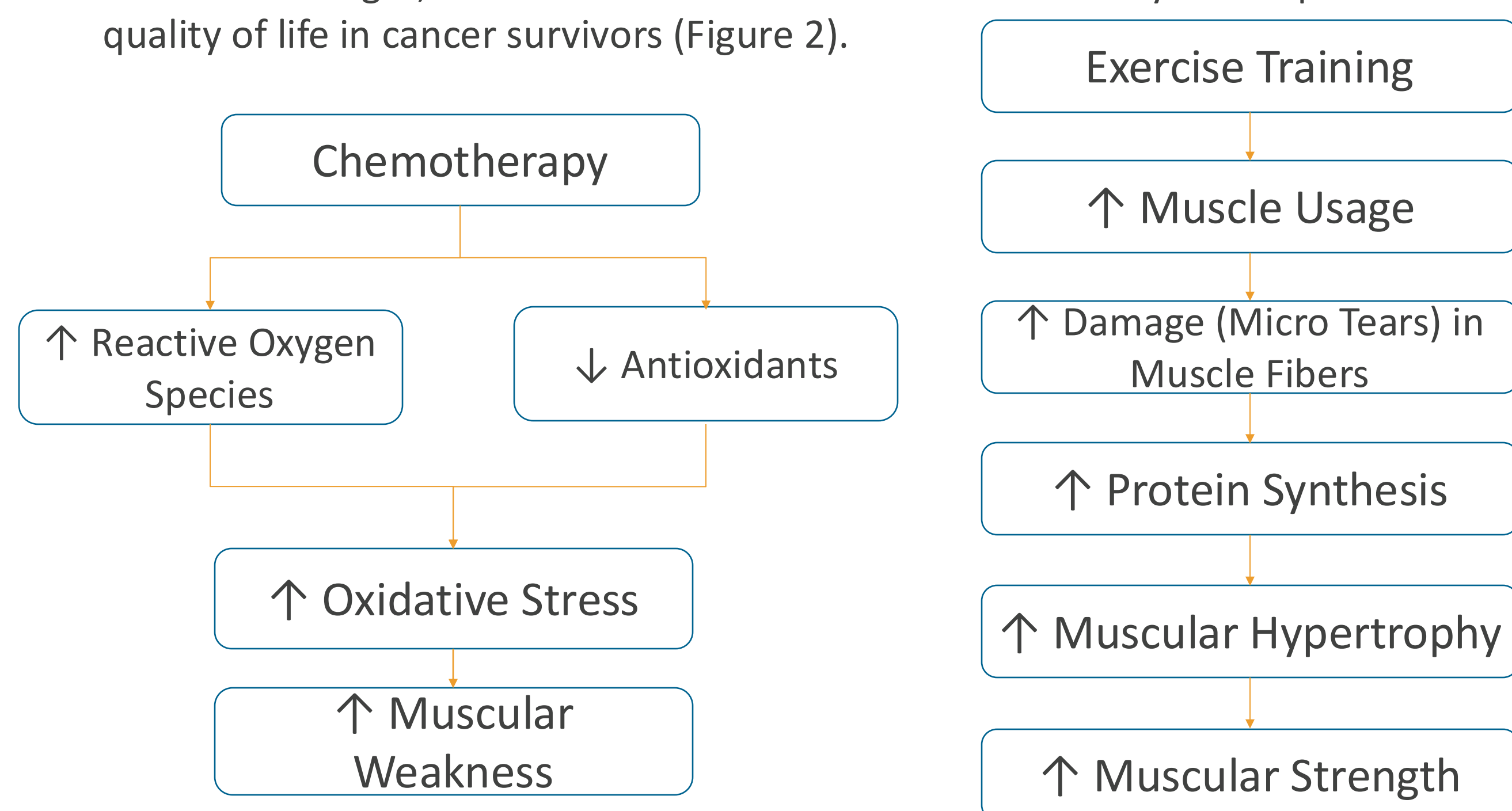


Figure 1. A possible mechanism for chemotherapy-induced muscle weakness.
Adapted from Gilliam et al. 2011

Figure 2. Mechanisms of exercise training and muscular strength.
Adapted from Hughes et al. 2018

- Purpose:** To evaluate whether a 16-week circuit-based, interval, aerobic and resistance exercise intervention can improve muscular strength in breast, prostate, and colorectal cancer survivors enrolled in the ACTIVATE Trial.

METHODS

- Study Sample:** Sedentary breast, prostate or colorectal cancer survivors with overweight (BMI ≥ 25) or obesity (BMI ≥ 30) were randomized to exercise (n=60) or usual care (n=30).

Exercise Intervention (Figure 3)

- Supervised circuit-based aerobic and resistance training
- 3 sessions/week for 16 weeks
- Moderate-to-vigorous intensity
 - Aerobic: 65-85% of VO_2 max
 - Resistance: 65-85% of 1-RM
- 60 min/session

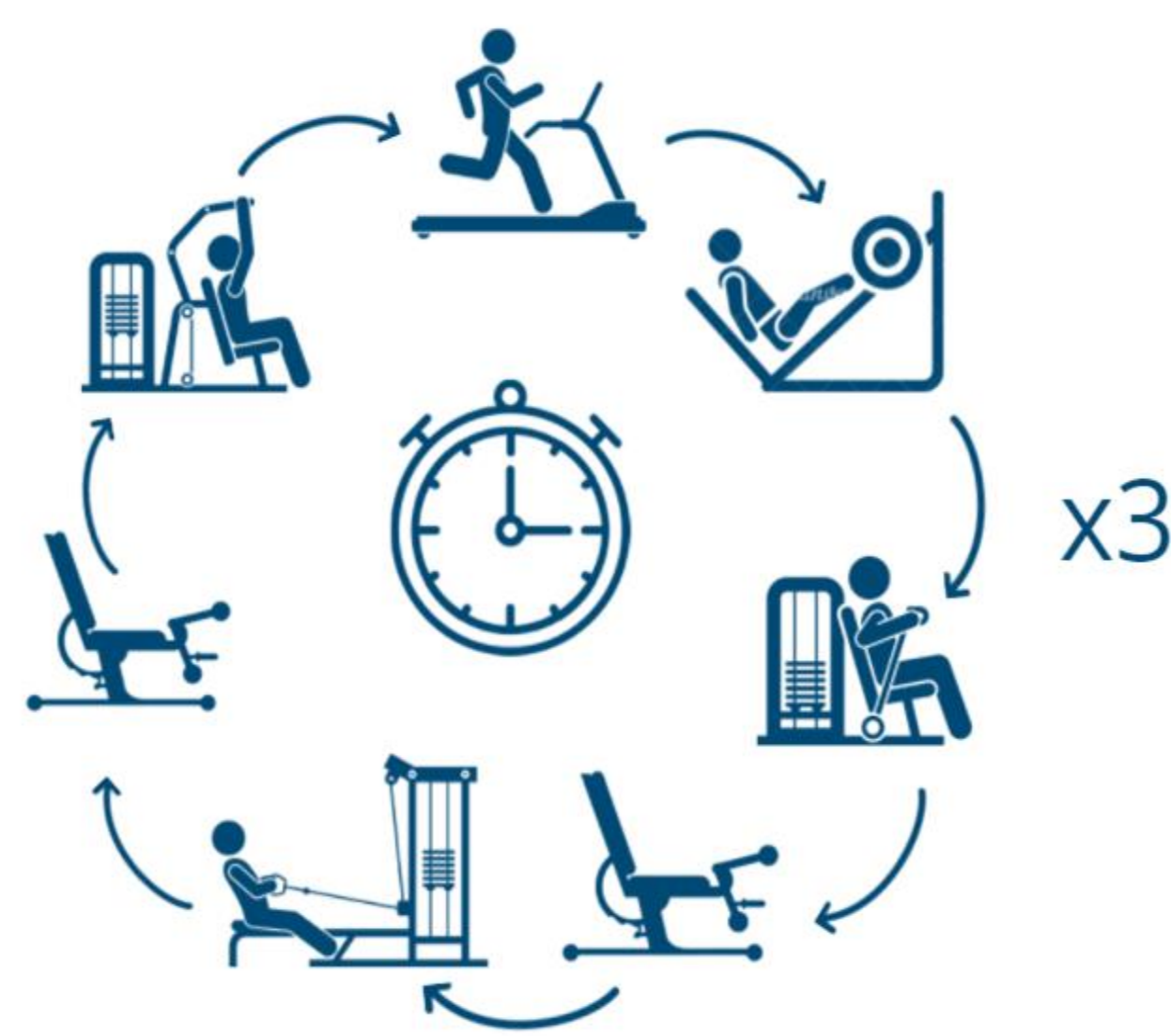


Figure 3. Circuit-based exercise intervention in the ACTIVATE Trial.

- Outcomes:** Muscular strength was measured at baseline and immediately post-intervention and assessed via 10-repetition maximum test on 6 exercises: Leg Press, Leg Extension, Leg Curl, Chest Press, Latissimus Pulldown, and Shoulder Press
- Analysis:** Repeated-measures analysis of variance and paired t-tests were run to assess within-and between-group differences.

RESULTS

Table 1. Baseline Characteristics

	Exercise (N=60)	Usual Care (N=30)
Age, years	64.7 \pm 9.5	62.6 \pm 11.2
Female, n (%)	24 (40)	14 (47)
Race, n (%)		
Non-Hispanic White	26 (43)	8 (27)
Hispanic White	16 (27)	4 (13)
Black	14 (23)	6 (20)
Cancer Diagnosis, n (%)		
Breast	20 (33)	18 (60)
Colon or rectum	17 (28)	7 (23)
Prostate	23 (38)	5 (17)
Treatment History, n (%)		
Chemotherapy	5 (8)	2 (7)
Radiation	10 (17)	10 (33)
Both	45 (75)	18 (60)
Body Mass Index, kg/m²	33.2 \pm 5.3	35.5 \pm 6.8
Physical Activity Level, min/week	15.8 \pm 5.3	20.7 \pm 7.7

*There were no significant differences between groups at baseline.

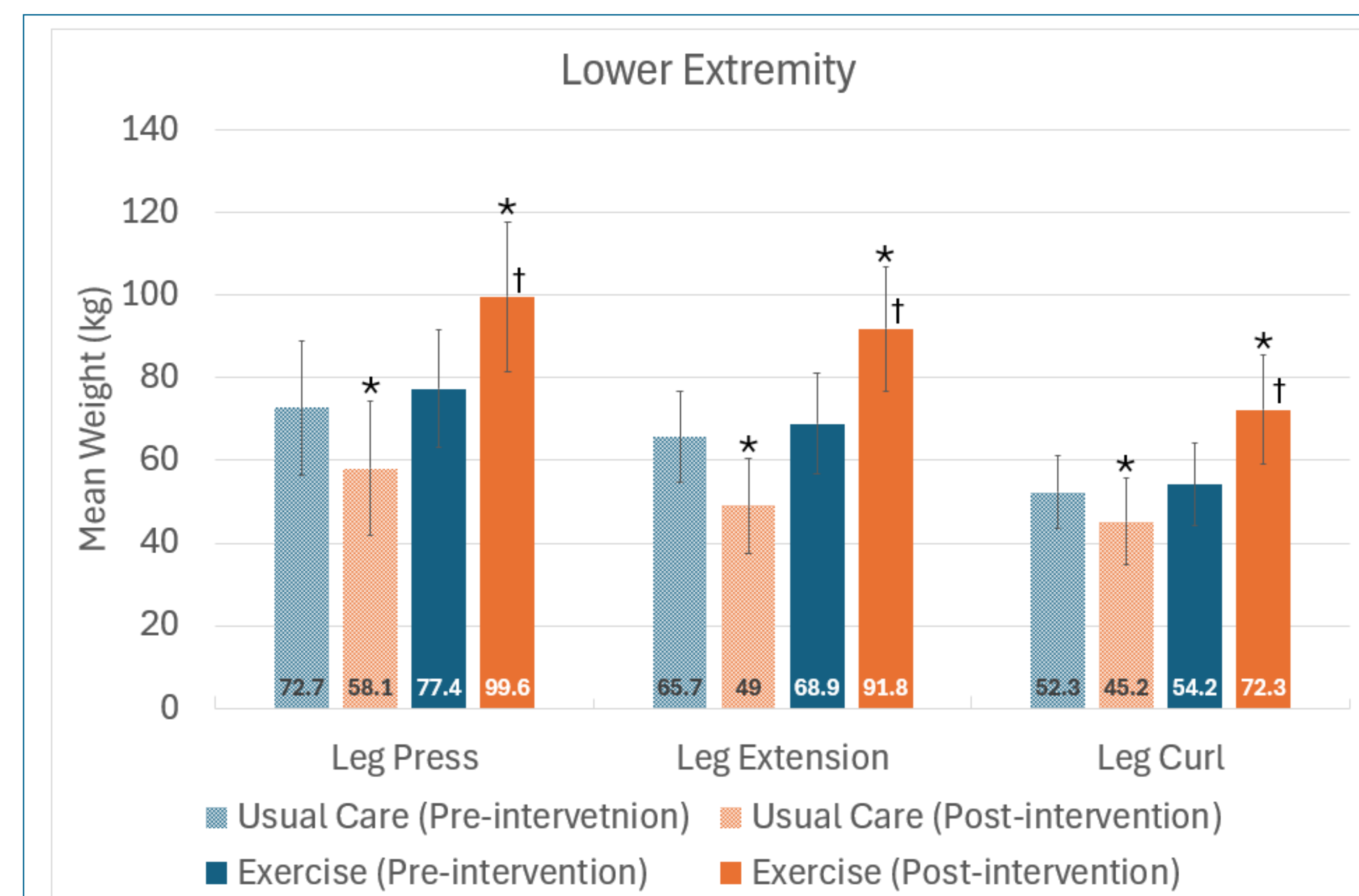


Figure 5: Lower Body Muscular Strength in Cancer Survivors. Mean weight over 10 repetitions for the usual care and exercise cohorts before vs. after the 16-week intervention. Error bars represent ± 1 standard deviation.

* $P < 0.01$ for post-intervention versus pre-intervention (within group)

† $P < 0.01$ for exercise group versus usual care group (between group)

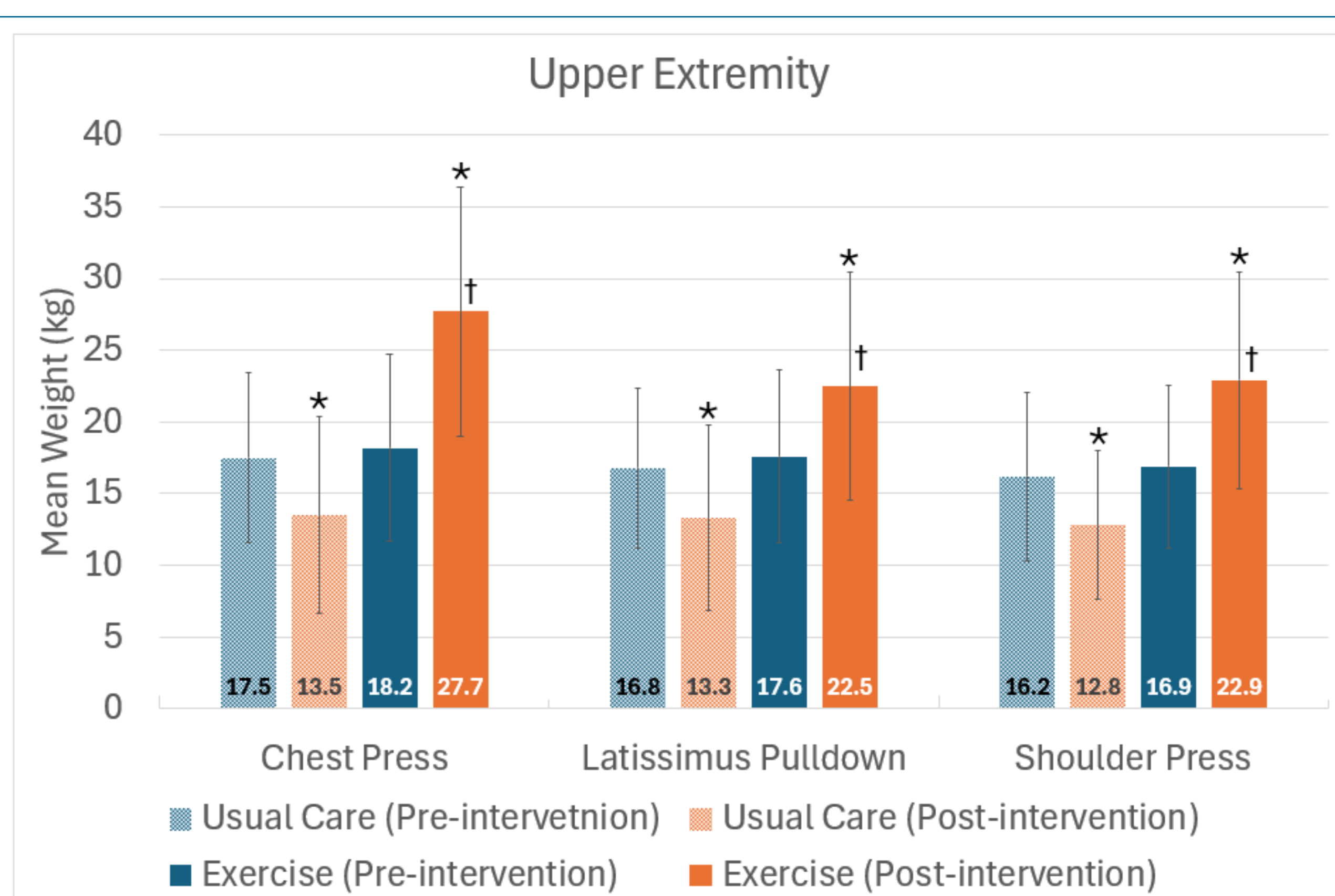


Figure 4: Upper Body Muscular Strength in Cancer Survivors. Mean weight over 10 repetitions for the usual care and exercise cohorts before vs. after the 16-week intervention. Error bars represent ± 1 standard deviation.

* $P < 0.01$ for post-intervention versus pre-intervention (within group)

† $P < 0.01$ for exercise group versus usual care group (between group)

CONCLUSIONS

- A 16-week circuit, interval-based aerobic and resistance exercise program improves muscular strength among breast, prostate, and colorectal cancer survivors.
- Considering the impact of muscular strength on cancer morbidity, mortality and quality of life, this study supports the importance of promoting regular exercise participation for cancer patients and survivors.
- Future studies should continue to explore how exercise can improve muscular strength across:
 - Diverse cancer populations (e.g., cancer types, stages, treatment histories, ages, race/ethnicity groups)
 - Different intervention designs (e.g., exercise types and intensities, intervention components, settings)
 - Follow-up periods to assess long-term impacts

CONNECT!

✉ dleeassett@gmail.com ✉ ChristinaM_Dieli-Conwright@dfci.harvard.edu

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