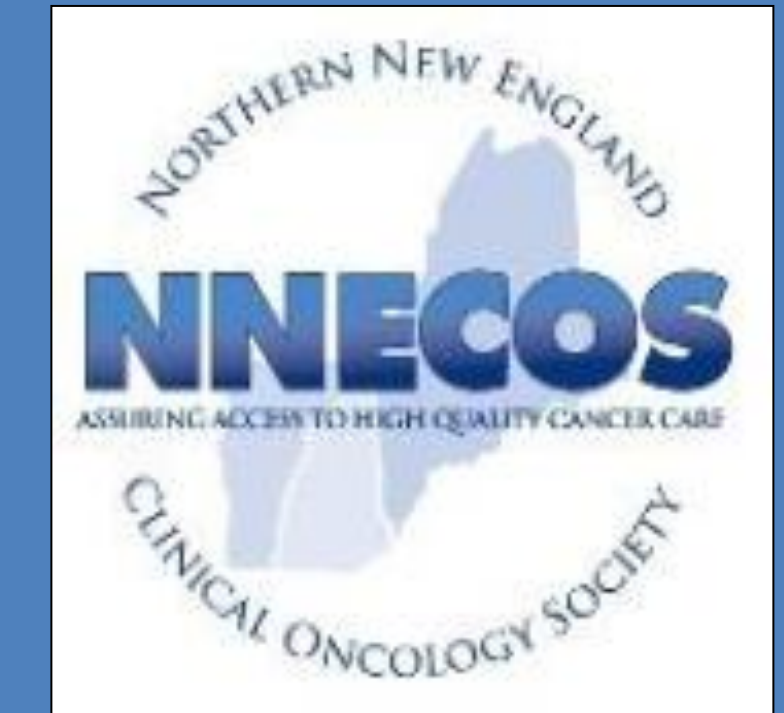




Differential Effects of Cardiovascular and Resistance Exercise on Functional Mobility in Individuals with Advanced Cancer: A Randomized Trial



Amy Litterini, PT, DPT,¹ Vickie Fieler, RN, PhD,² James Cavanaugh, PT, PhD,¹ Jeannette Lee, PT, PhD³

¹Department of Physical Therapy, University of New England, Portland, ME; ²St. Joseph Hospital, Nashua, NH;

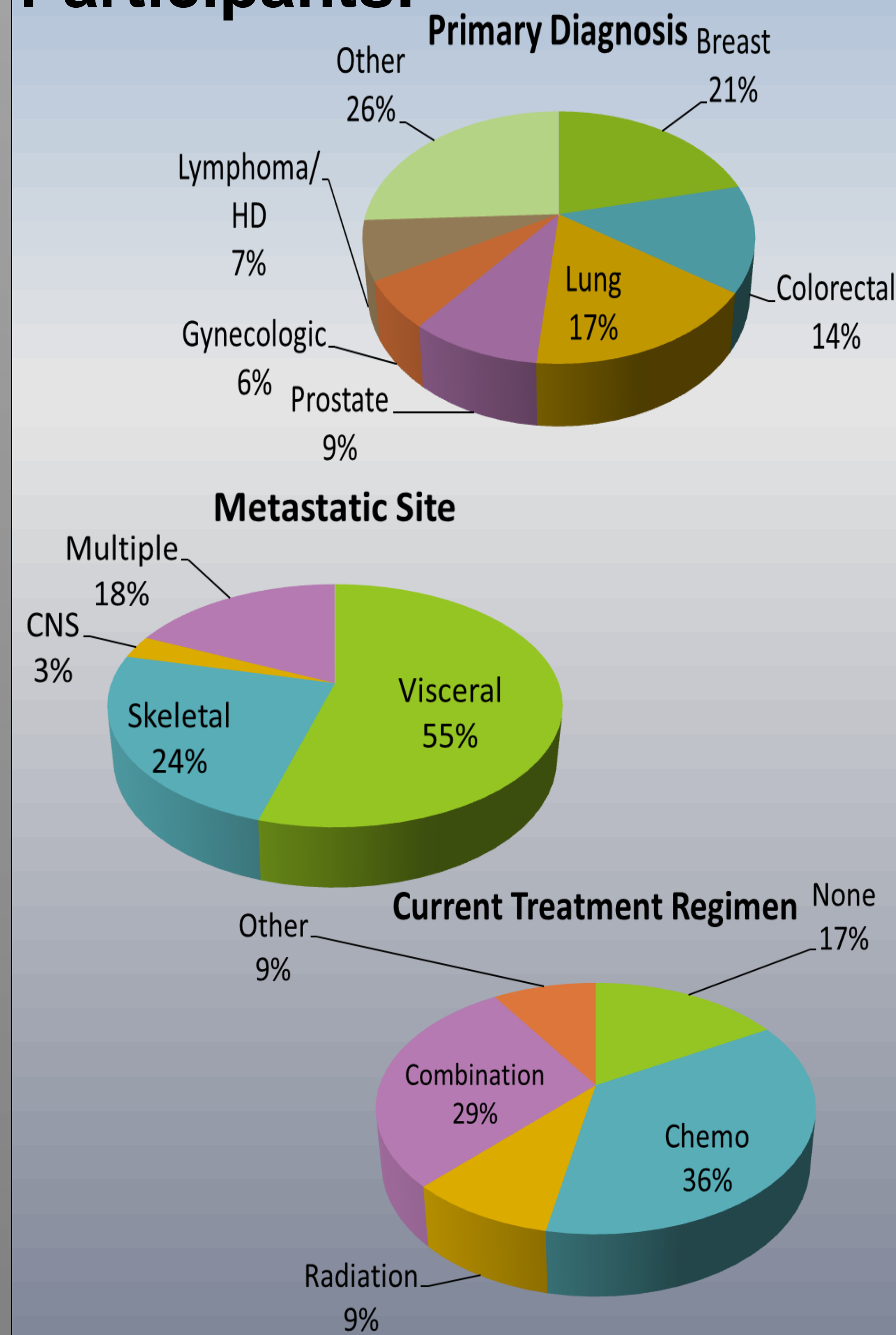
³University of California San Francisco/San Francisco State University Graduate Program in Physical Therapy, San Francisco, CA.

Objective: To compare the effects of resistance and cardiovascular exercise on functional mobility in individuals with advanced cancer.

Design: Prospective, 2-group pretest-posttest pilot study with randomization to either resistance or cardiovascular exercise mode.

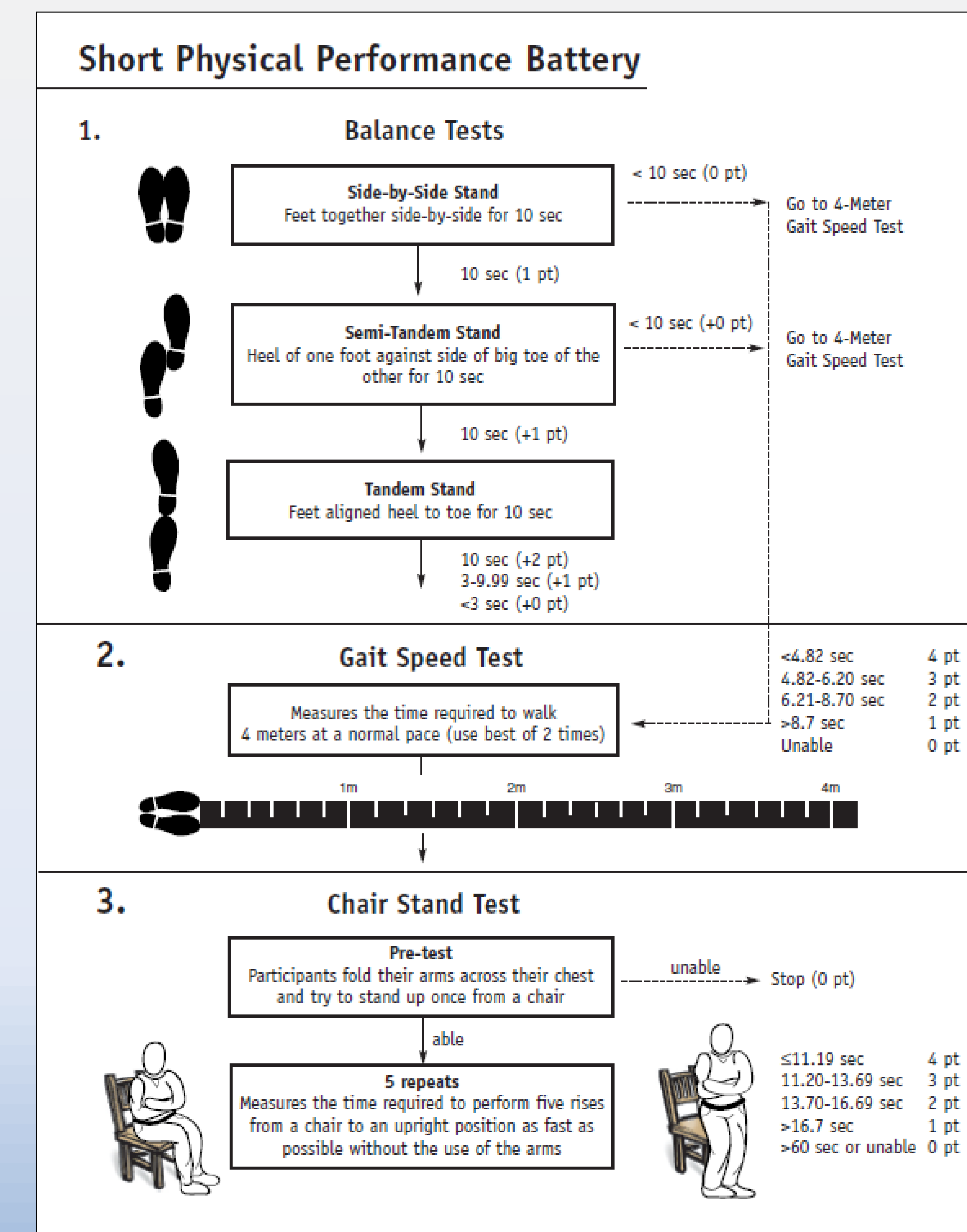
Setting: Comprehensive community cancer center and a hospital-based fitness facility.

Participants:



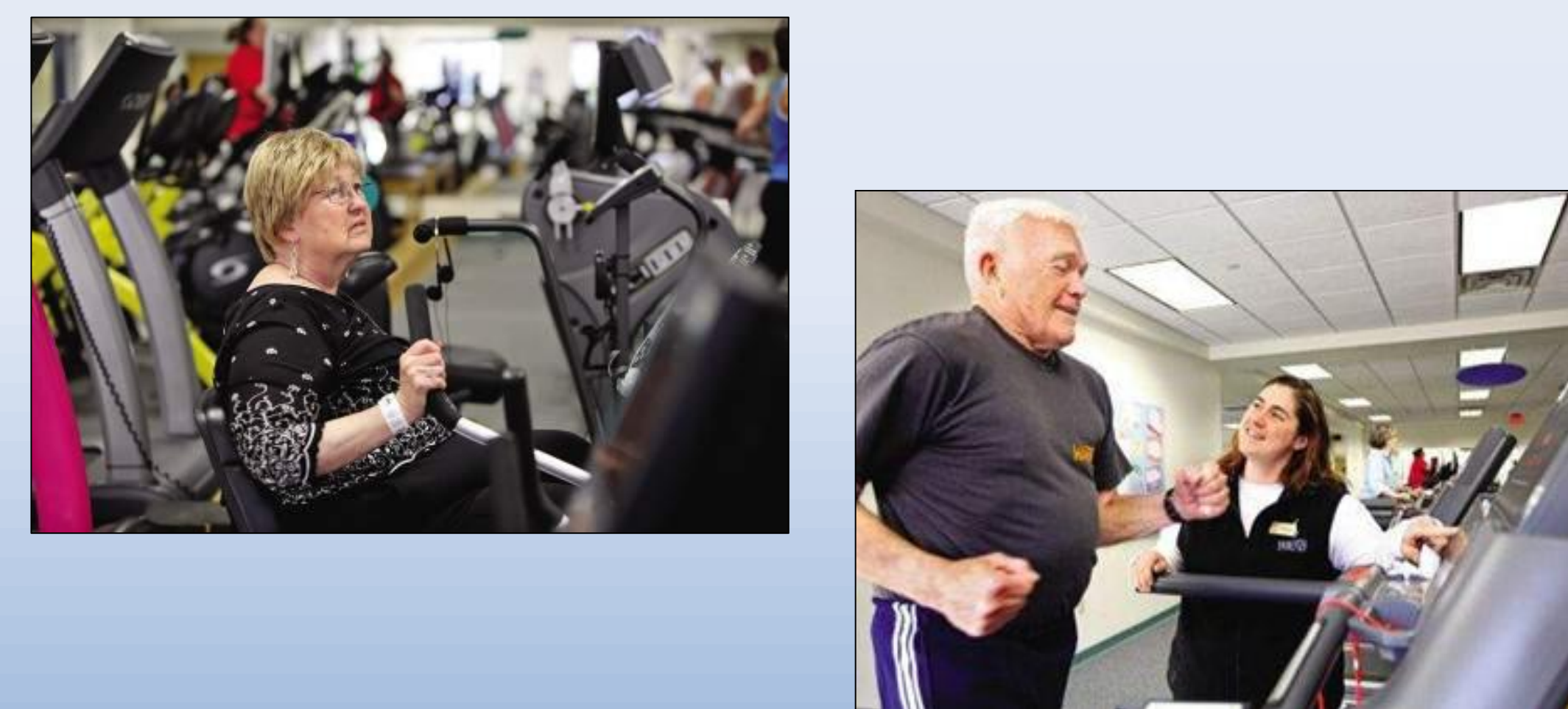
Demographics: Volunteer sample of individuals with advanced cancer recruited through the cancer center, palliative care service, rehabilitation department, and a local hospice.

	Group		Total (n=66)
	Cardiovascular (n=32)	Resistance (n=34)	
Age (yrs.)	62.53±12.83	62.18 ± 14.28	62.35 ± 13.49
Gender	14 M, 18 F	16 M, 18 F	30 M, 36 F
Ethnicity			
Caucasian	31	33	64
Hispanic/ other	1	1	2



Outcome Measures: Functional mobility was assessed using the Short Physical Performance Battery (SPPB); self-reported pain and fatigue were assessed secondarily using visual analog scales. Data were analyzed using a split plot 2x2 analysis of variance ($\alpha=.05$).

Interventions: Ten weeks of individualized resistance or cardiovascular exercise, prescribed and monitored by oncology-trained physical therapists and exercise personnel.



Results:

	Group				Total	
	Cardiovascular		Resistance		Baseline	10 weeks
Fatigue (mm)	31.06 ± 27.84	26.17 ± 21.81	42.62 ± 29.96	31.35 ± 24.35	37.02 ± 28.93	28.46 ± 22.88
Pain (mm)	13.75 ± 16.23	12.52 ± 15.94	17.65 ± 19.46	15.83 ± 20.69	15.67 ± 18.46	13.98 ± 18.08
SPPB total(max. score 12)	9.77 ± 2.25	10.45 ± 2.05	9.38 ± 2.10	9.91 ± 1.95	9.55 ± 2.16	10.33 ± 1.82
Balance (max. score 4)	3.58 ± 0.72	3.76 ± 0.64	3.68 ± .64	3.83 ± 0.49	3.67 ± 0.65	3.82 ± 0.52
Gait (max. score 4)	3.71 ± 0.69	3.79 ± 0.62	3.76 ± 0.70	3.91 ± 0.42	3.71 ± 0.70	3.88 ± 0.48
Chair stands(max. score 4)	2.52 ± 1.26	2.90 ± 1.14	1.97 ± 1.31	2.17 ± 1.53	2.20 ± 1.32	2.63 ± 1.33
Gait speed (m/s)	1.03 ± 0.22	1.08 ± .28	1.01 ± 0.26	1.14 ± 0.45	1.02 ± 0.25	1.12 ± 0.35

Results: Fifty-two patients (78.8%) completed the study: 23 (67.7%) of 34 patients in the resistance arm and 29 (90.6%) of 32 patients in the cardiovascular arm. No participant withdrew because of study adverse events. Ten-week outcomes (n=52) included a significant increase in SPPB total score ($P<.001$), increase in gait speed ($P=.001$), and reduction in fatigue ($P=.05$). Although cardiovascular exercise participants had a modestly greater improvement in SPPB total score than resistance training participants ($F_{1,49}=4.21$, $P=.045$), the difference was not confirmed in a subsequent intention-to-treat analysis ($N=66$).

Conclusions: Individuals with advanced cancer appear to benefit from exercise for improving functional mobility. Neither resistance nor cardiovascular exercise appeared to have a strong differential effect on outcome.



Cancer Well-fit study staff from top L: Tammy Mazur, Amy Litterini, Christine Buco; Center: Patti Bartlett; Bottom: Chuck Memmesheimer. Absent Cancer Well-fit staff: Michele Tillson, Shannon Ward, Eddie DiMuzio, Sue Goodreau and Larina Perry

Acknowledgements: This study would not have been possible without the dedication of our inspirational cancer survivors. We wish to thank the staff of the Exeter Hospital Center for Cancer Care and the Cancer Well-fit Program for the help conducting this study. We also wish to thank the Northern New England Clinical Oncology Society for their generous support.