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REDUCED SEDENTARY TIME INTERVENTION FOR BREAST CANCER SURVIVORS: OBJECTIVELY-MEASURED OUTCOMES FOR ACTIVITY AND METABOLISM

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BACKGROUND

Physical activity (PA) promotion and sedentary behavior reduction among cancer survivors is a national priority[1] and the number of PA-based behavioral interventions has expanded considerably in recent years.[2]

There have been relatively few trials focused on reduction of sedentary time among cancer survivors due in part to past limitations related to precise quantitative measurement of sedentary behaviors.[3]

Many PA interventions rely on clinic-based coaching which is both time-intensive and unrealistic for many clinics.[4]

The purpose of this study was to investigate the feasibility and effects of a home based 6 week reduced sedentary time intervention (RSTI) in breast cancer survivors who had completed primary treatment.

ClinicalTrials.gov NCT02969291

METHODS

- **Phase 1 proof-of-concept/feasibility trial**
- **One Group Pre/Post-test Design**

ELIGIBILITY CRITERIA

Designed to select a sample of breast cancer survivors most likely to benefit from a home-based intervention designed to reduce sedentary behavior.

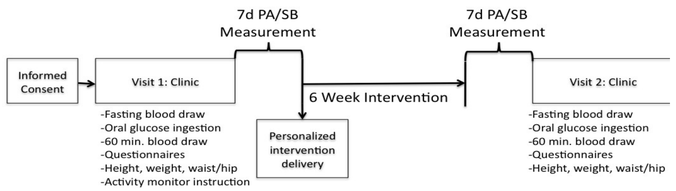
Inclusion Criteria:

- **Stage I-III breast cancer survivors age 20-80 who have completed primary treatment greater than 6 months but less than 5 years. Patients may be on adjuvant hormonal therapy.**
- **BMI >25**
- **Less than 150 min/week moderate to vigorous exercise**
- **No gain or loss of >10% body weight over prior 6 months**

Exclusion Criteria:

- **Known diabetes**
- **Known coronary artery disease**
- **Pregnancy**

Figure 1. Study Flow (PA=Physical Activity, SB=Sedentary Behavior)



INTERVENTION

Figure 2. ActivPAL Accelerometer

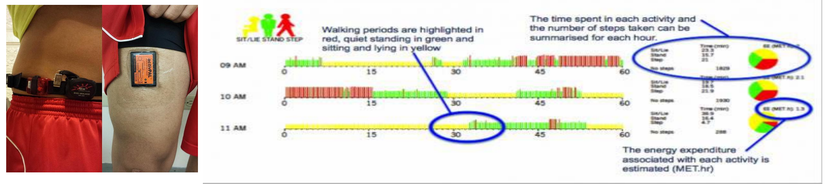
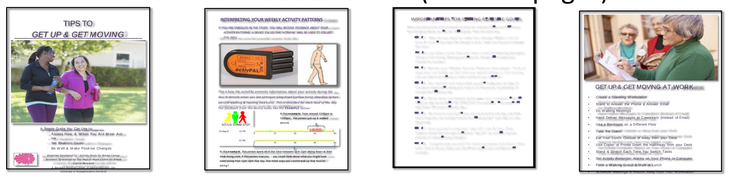


Figure 3. Personalized Feedback & Suggestions for Environmental Modifications to Reduce Sedentarism (selected pages)



RESULTS

Table 1. Participant Demographics (Total N=16)

Participants		
No. Completed study		13
Race	Black	3
	White	13
Median Age (range)		61.3 (49-73)
Median Time since diagnosis (range)		34.4 months (11-55)
Prior Therapy	Radiation	13
	Chemotherapy	11
	Hormonal	12

Table 2. Sedentary & Activity Outcomes

Variable Name	Average (SD)		T-Test (* = p < .05)
Total daily steps	Baseline:	6190.40 (2086.25)	0.76
	Post Intervention:	6326.30 (2788.41)	
Total energy expenditure/day (MET/hr.)	Baseline:	33.05 (0.92)	0.74
	Post:	33.11 (1.16)	
% of hourly time spent in uninterrupted sedentary behavior (8am-8pm)	Baseline:	20% (13%)	0.63
	Post Intervention:	22% (11%)	

Metabolic parameters pre- and post intervention

Table 3. Metabolic Outcomes

n=13	Pre-intervention	Post-intervention	(%) change	P-value
Hormones and metabolites				
Fasting glucose (mg/dl)	126.1 ± 44.1	127.4 ± 34.2	+1.0	0.87
1h glucose (mg/dl)	180.2 ± 95.8	188.5 ± 82.4	+4.6	0.51
Fasting insulin (uU/ml)	15.3 ± 6.2	17.5 ± 9.0	+14.4	0.25
1h insulin (uU/ml)	121.6 ± 61.8	123.1 ± 58.3	+ 1.2	0.84
Leptin (ng/ml)	55.5 ± 31.6	44.6 ± 26.0	- 19.6	0.01*
C-reactive protein (ng/ml)	237.1 ± 257.4	225.3 ± 259.5	- 5.0	0.68
Triglyceride (mg/dl)	107.2 ± 58.8	112.8 ± 52.8	+ 5.2	0.49
Total Cholesterol (mg/dl)	189.9 ± 22.2	195.6 ± 18.4	+ 3.0	0.32
HDL Cholesterol (mg/dl)	52.9 ± 14.6	58.5 ± 20.6	+ 10.6	0.07
LDL Cholesterol (mg/dl)	114.9 ± 26.6	114.6 ± 26.9	- 0.2	0.95
Metrics of glycemic control				
HOMA-IR	2.2 ± 1.1	2.4 ± 1.3	+ 9.0	0.34
HOMA-%B	86.9 ± 22.7	89.1 ± 24.1	+ 2.1	0.75
$IGI_{(0\text{-}60)}$	0.40 ± 0.97	0.57 ± 0.73	+ 42.5	0.34
$DI_{(HOMA\text{-}IR \times IGI)}$	1.26 ± 2.69	1.56 ± 2.19	+23.8	0.51

Mean ± SD. HDL- High density lipoprotein, LDL- Low density lipoprotein, IGI- Insulinogenic index; DI- Disposition Index. *p<0.05

CONCLUSION

Results indicate that similar home-based RSTIs are safe, acceptable to survivors, and feasible to implement by cancer center staff.

Further research with larger samples and possible monitoring of interruptions in total sedentary time may be needed to establish efficacy and effect sizes for the intervention.

A larger dose or addition of behavior-activating components (use of daily activity trackers, text messages, or coaching) may be necessary to realize clinically- meaningful changes in sedentarism, daily activity, metabolism and behavior change. **These preliminary results suggest provision of educational material/one-time feedback is likely insufficient to meet PA guidelines & reduce sedentary time.**

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- *Acknowledgement of UMASS-Amherst nurses L.Carvalho, E.Lamoureux, and K. Bobianski for their contributions*

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