

Supplementary Material

Multicenter Randomized Controlled Trial of Exercise in Aortic Dissection Survivors: Rationale, Design, and Initial Hemodynamic Data

Supplemental Text 1. BRFSS Questionnaire

BRFSS Questionnaire: Physical Activity

When you are at work, which of the following best describes what you do?

If you have more than one job, consider all jobs in your answer.

- Mostly sitting or standing
- Mostly walking
- Mostly heavy labor or physically demanding work
- Don't know / Not sure
(include all jobs)

We are interested in two types of physical activity: vigorous and moderate. Vigorous activities cause large increases in breathing or heart rate. Moderate activities cause small increases in breathing or heart rate.

Thinking about the moderate activities you do in a usual week, do you do moderate activities for at least 10 minutes at a time, such as brisk walking, bicycling, vacuuming, gardening, or anything else that causes a small increase in breathing or heart rate?

- Yes
- No
- Don't know / Not sure

How many days per week do you do these moderate activities for at least 10 minutes at a time? _____

On days when you do moderate activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities? Answer to the nearest hour. _____

Now, thinking about the vigorous activities you do in a usual week, do you do vigorous activities for at least 10 minutes at a time, such as running, aerobics, heavy yard work, or anything else that causes large increases in breathing or heart rate?

- Yes
- No
- Don't know / Not sure

How many days per week do you do these vigorous activities for at least 10 minutes at a time? _____

On days when you do vigorous activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities? Answer to the nearest hour. _____

For BRFSS Survey Questions

Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Questionnaire.

Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2009.

<http://www.cdc.gov/brfss/suggestedcitation.htm>

Supplemental Text 2. PROMIS Questionnaires

1) PROMIS - Physical Function

Please complete the survey below.

Thank you!

FINAL RESULTS

T-score

Standard Error

PFA11

Are you able to do chores such as vacuuming or yard work?

- Without any difficulty
- With a little difficulty
- With some difficulty
- With much difficulty
- Unable to do

PFA21

Are you able to go up and down stairs at a normal pace?

- Without any difficulty
- With a little difficulty
- With some difficulty
- With much difficulty
- Unable to do

PFA23

Are you able to go for a walk of at least 15 minutes?

- Without any difficulty
- With a little difficulty
- With some difficulty
- With much difficulty
- Unable to do

PFA53

Are you able to run errands and shop?

- Without any difficulty
- With a little difficulty
- With some difficulty
- With much difficulty
- Unable to do

2) PROMIS - Anxiety

FINAL RESULTS

T-score

Standard Error

EDANX01

In the past 7 days
I felt fearful

- Never
- Rarely
- Sometimes
- Often
- Always

EDANX40

In the past 7 days
I found it hard to focus on anything other than my
anxiety

- Never
- Rarely
- Sometimes
- Often
- Always

EDANX41

In the past 7 days
My worries overwhelmed me

- Never
- Rarely
- Sometimes
- Often
- Always

EDANX53

In the past 7 days
I felt uneasy

- Never
- Rarely
- Sometimes
- Often
- Always

3) PROMIS - Depression

FINAL RESULTS

T-score

Standard Error

EDDEP04

In the past 7 days
I felt worthless

- Never
- Rarely
- Sometimes
- Often
- Always

EDDEP06

In the past 7 days
I felt helpless

- Never
- Rarely
- Sometimes
- Often
- Always

EDDEP29

In the past 7 days
I felt depressed

- Never
- Rarely
- Sometimes
- Often
- Always

EDDEP41

In the past 7 days
I felt hopeless

- Never
- Rarely
- Sometimes
- Often
- Always

Acknowledgment: PROMIS Health Organization and Assessment CenterSM View full acknowledgment

4) PROMIS - Fatigue

FINAL RESULTS

T-score

Standard Error

HI7

During the past 7 days:
I feel fatigued

- Not at all
- A little bit
- Somewhat
- Quite a bit
- Very much

FATEXP40

In the past 7 days
How fatigued were you on average?

- Not at all
- A little bit
- Somewhat
- Quite a bit
- Very much

FATEXP41

In the past 7 days
How run-down did you feel on average?

- Not at all
- A little bit
- Somewhat
- Quite a bit
- Very much

An3

During the past 7 days:
I have trouble starting things because I am tired

- Not at all
- A little bit
- Somewhat
- Quite a bit
- Very much

Acknowledgment: PROMIS Health Organization and Assessment CenterSM View full acknowledgment

5) PROMIS - Sleep Disturbance

FINAL RESULTS

T-score

Standard Error

Sleep116

In the past 7 days
My sleep was refreshing.

- Not at all
- A little bit
- Somewhat
- Quite a bit
- Very much

Sleep20

In the past 7 days
I had a problem with my sleep.

- Not at all
- A little bit
- Somewhat
- Quite a bit
- Very much

Sleep44

In the past 7 days
I had difficulty falling asleep.

- Not at all
- A little bit
- Somewhat
- Quite a bit
- Very much

Sleep109

In the past 7 days
My sleep quality was...

- Very poor
- Poor
- Fair
- Good
- Very good

Acknowledgment: PROMIS Health Organization and Assessment CenterSM View full acknowledgment

6) PROMIS - Ability to Participate Social

FINAL RESULTS

T-score

Standard Error

SRPPER11_CaPS

I have trouble doing all of my regular leisure activities with others

- Never
- Rarely
- Sometimes
- Usually
- Always

SRPPER18_CaPS

I have trouble doing all of the family activities that I want to do

- Never
- Rarely
- Sometimes
- Usually
- Always

SRPPER23_CaPS

I have trouble doing all of my usual work (include work at home)

- Never
- Rarely
- Sometimes
- Usually
- Always

SRPPER46_CaPS

I have trouble doing all of the activities with friends that I want to do

- Never
- Rarely
- Sometimes
- Usually
- Always

Acknowledgment: PROMIS Health Organization and Assessment CenterSM View full acknowledgment

7) PROMIS - Pain Interference

FINAL RESULTS

T-score

Standard Error

PAININ9

In the past 7 days
How much did pain interfere with your day to day
activities?

- Not at all
- A little bit
- Somewhat
- Quite a bit
- Very much

PAININ22

In the past 7 days
how much did pain interfere with work around the home?

- Not at all
- A little bit
- Somewhat
- Quite a bit
- Very much

PAININ31

In the past 7 days
How much did pain interfere with your ability to
participate in social activities?

- Not at all
- A little bit
- Somewhat
- Quite a bit
- Very much

PAININ34

In the past 7 days
How much did pain interfere with your household
chores?

- Not at all
- A little bit
- Somewhat
- Quite a bit
- Very much

Acknowledgment: PROMIS Health Organization and Assessment CenterSM View full acknowledgment

Supplemental Text 3. Clinical Trial Evaluation Survey

Evaluation Survey

Please complete the survey below.

Thank you!

Directions: Please answer each question by using the slider to indicate which choice most accurately describes you. Read each question carefully.

Prompt: Before attending an in-person enrollment visit for the clinical trial...

1) How did you generally feel about engaging in moderate physical activity?

Confident Neutral Uneasy

(Place a mark on the scale above)

2) How would you rate your confidence to engage in physical activity?

High confidence Moderate confidence Low confidence

(Place a mark on the scale above)

3) How would you rate your outlook on exercise post-dissection?

Excited Neutral Discouraged

(Place a mark on the scale above)

Prompt: After attending an in-person study visit for the clinical trial...

4) How do you generally feel about engaging in moderate physical activity?

Confident Neutral Uneasy

(Place a mark on the scale above)

5) How would you rate your confidence to engage in physical activity?

High confidence Moderate confidence Low confidence

(Place a mark on the scale above)

6) How would you rate your outlook on exercise post-dissection?

Excited Neutral Discouraged

(Place a mark on the scale above)

Directions: please select the choice that most accurately describes you.

7) Participating in the clinical trial has positively changed my outlook on exercise post-dissection.

- Strongly Disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly Agree

8) Participating in the clinical trial has not changed my exercise-on-exercise post-dissection.

Strongly Disagree outlook on
Disagree
Neither
agree
e nor
disagree
Agree
e
Strongly Agree

9) Participating in the clinical trial has negatively outlook on exercise post-dissection.

Strongly Disagree changed my
Disagree
Neither
agree
e nor
disagree
Agree
e
Strongly Agree

10) Please use this field to provide any feedback about your experiences with the clinical trial thus far.

Supplementary Table 1. Demographic Characteristics by Intervention Type

Variable	Participants (n = 81)	TEVAR (n = 12)	Open Repair (n = 53)	No Intervention (n = 16)
Age (y)	56.6 (16.8)	52.5 (14.1)	57.6 (11)	56.5 (22.1)
Sex				
Female	22 (27)	2 (17)	14 (26)	6 (38)
Antihypertensive Medications	2 (1)	3 (3)	2 (1)	2 (1)
Beta blocker	75 (93)	12 (100)	49 (92)	14 (88)
ACEi/ARB	45 (56)	8 (67)	30 (57)	7 (44)
Diuretic	22 (27)	5 (42)	14 (26)	3 (19)
Calcium channel blocker	31 (38)	7 (58)	17 (32)	7 (44)
Dissection Data				
Time since dissection (y)	3.5 (3)	2.2 (3)	3.8 (3)	3.9 (3)
Type A	51 (63)	2 (17)	44 (83)	5 (31)
Type B	25 (31)	10 (83)	4 (8)	11 (69)
Multiple dissections	5 (6)	0 (0)	5 (9)	0 (0)

Values are mean (interquartile range), n (%). ACEi: angiotensin-converting enzyme inhibitor. ARB: angiotensin II receptor blockers.

Supplementary Table 2. ABPM Characteristics by Intervention Type

Variable	Total (n=70)	TEVAR (n = 10)	Open Repair (n=47)	No Intervention (n=13)	<i>P</i>
Mean SBP	119 (16)	121 (7)	118 (16)	121 (20)	0.9
Mean DBP	67 (12)	69 (10)	66 (11)	69 (14)	0.7
Day SBP	123 (18)	124 (11)	122 (18)	124 (14)	0.9
Day DBP	70 (12)	71 (12)	68 (11)	71 (11)	0.7
Night SBP	111 (16)	113 (17)	109 (16)	113 (15)	0.8
Night DBP	61 (14)	64 (12)	60 (11)	63 (14)	0.5
Peak daytime SBP	157 (28)	149 (7)	158 (27)	153 (28)	0.6
Pulse Pressure	50 (12)	52 (11)	52 (12)	52 (11)	0.9
Daytime SBP COV	11 (4)	10 (1.5)	11 (5)	9 (2)	0.08
Morning Surge Index (%)	16 (18)	21 (7)	17 (16)	12 (23)	0.4
Nocturnal Dipping (%)	12 (12)	7 (7)	13 (9)	11 (13)	0.3
AASI	0.53 (0.16)	0.6 (0.20)	0.53 (0.17)	0.48 (0.15)	0.2

Values are mean (interquartile range). SBP: systolic blood pressure; DBP: diastolic blood pressure; PP: pulse pressure; AASI: ambulatory arterial stiffness index; COV: coefficient of variation; *: ANOVA $P < 0.05$.

Supplementary Table 3. Most frequently observed Space Labs ABPM error codes.

Error Code	Condition
EC04	Occasional EC04 messages reflect excessive patient movement. Frequent EC04 messages indicate an improperly applied cuff or a monitor malfunction
EC10, 70, 90	Excessive movement
EC11	Monitor did not pump above mean arterial level
EC40	Movement during systole
EC50, 58	Movement during diastole
EC52	Kinked tubing
EC62	Cuff applied too loosely

PROMIS Scores by Intervention Type

Evaluation of seven PROMIS domains in patients who received no intervention found that mean T scores for anxiety (52 ± 10), pain (51 ± 8), and impairment of participation in social activities (54 ± 8) were increased. Similarly, for patients who received open repair, the mean T scores for anxiety (52 ± 8), pain (51 ± 7), and impairment of participation in social activities (54 ± 8) were also increased. For participants who received TEVAR, the mean T scores for pain (52 ± 8) and impairment of participation in social activities (55 ± 7) were increased. All other PROMIS domains were within normal limits for each group.

Grip Strength by Intervention Type

At baseline, the mean maximum grip strength for the no intervention, open repair, and TEVAR groups were as follows: 58.6 lbs (IQR 4.3), 66.4 lbs (IQR 14.35), 62.5 lbs (IQR 3.2).

Orthostasis by Intervention Type

At baseline, 20% of patients who received no intervention, 4% of patients who received open repair, and 23% of patients who received TEVAR exhibited postural orthostasis.

Exertional Hypertension by Intervention Type

15 participants exhibited exertional hypertension. One patient in the open repair group developed severe exertional hypertension >210 mmHg. Exercises that caused SBP to exceed 180 mmHg for the no intervention group were: wall sits (50%), stationary bicycling (50%), and treadmill (50%). For the open repair group, exercises that caused SBP to exceed 180 mmHg were: bicep curls (27%), wall sits (55%), leg raise (1%), stationary bicycling (18%), and treadmill (1%). For the TEVAR group, exercises that caused SBP to exceed 180 mmHg were: hand grip (50%), stationary bicycling (50%), and treadmill (50%).