

Exercising Safely with Thoracic Aortic Disease: Guidance and Resources

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Symposium 2026**

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Reasons to recommend exercise



LOWERS BLOOD
PRESSURE



IMPROVES
FITNESS AND
ENDURANCE



TREATS
DEPRESSION



INCREASES
CONFIDENCE AND
REDUCES ANXIETY

Reasons to be concerned about exercise

Some exercises may cause aortic dissections

Safety not established in patients with TAD

Blood pressure may increase during exercise

No clinical guidelines

Anxiety and uncertainty

Pilot trial: Exercise after aortic dissection

2022:
Poll

2023:
Grant

2024:
Trial

- 80% of clinicians support prioritizing patient activity over safety



\$50,000

- Randomized controlled
- Pragmatic
- Multicenter
- Safety, BP, Mental health



The University of Texas
Health Science Center at Houston



JOHN RITTER RESEARCH PROGRAM
AORTIC & VASCULAR DISEASES

Exercise after aortic dissection

Rationale

Show that moderate-intensity exercises are safe after AD

Reduce anxiety and increase confidence to engage in activities

Reduce systolic blood pressure and arterial stiffness.

Home exercise can expand benefits to patients who cannot access CR.

Exercise after aortic dissection

Objectives

Measure the psychosocial impacts of exercise

Track self-reported activities and time spent

Measure blood pressure responses to exercises

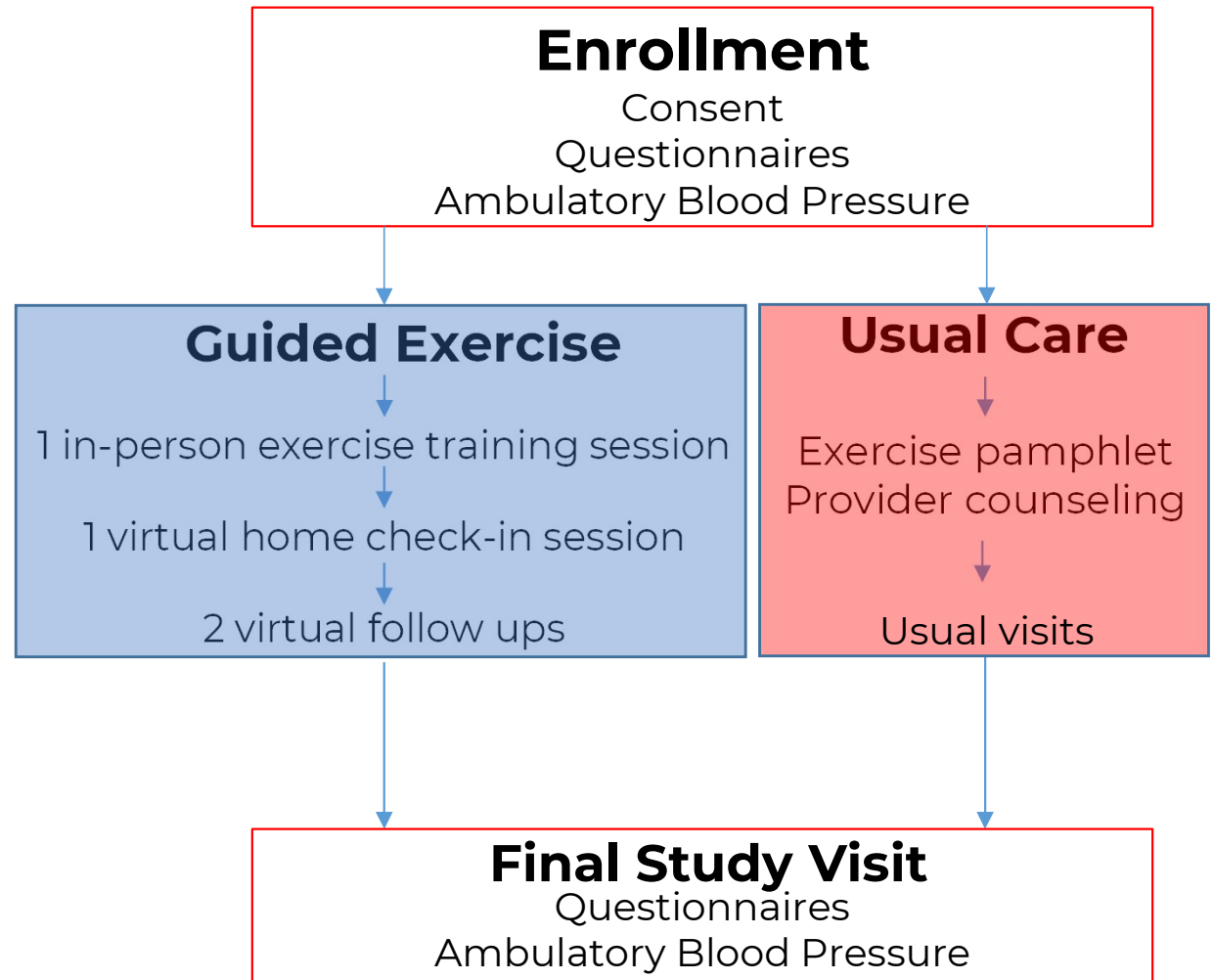
Inclusion Criteria: Exercise after aortic dissection

- Thoracic aortic dissection (Type A or B)
- At least 3 months prior to study enrollment
- Can attend two in-person sessions at one of our study sites:



Exercise after aortic dissection

Design



Circuit: Exercise after aortic dissection

Principles:

Spotting for safety

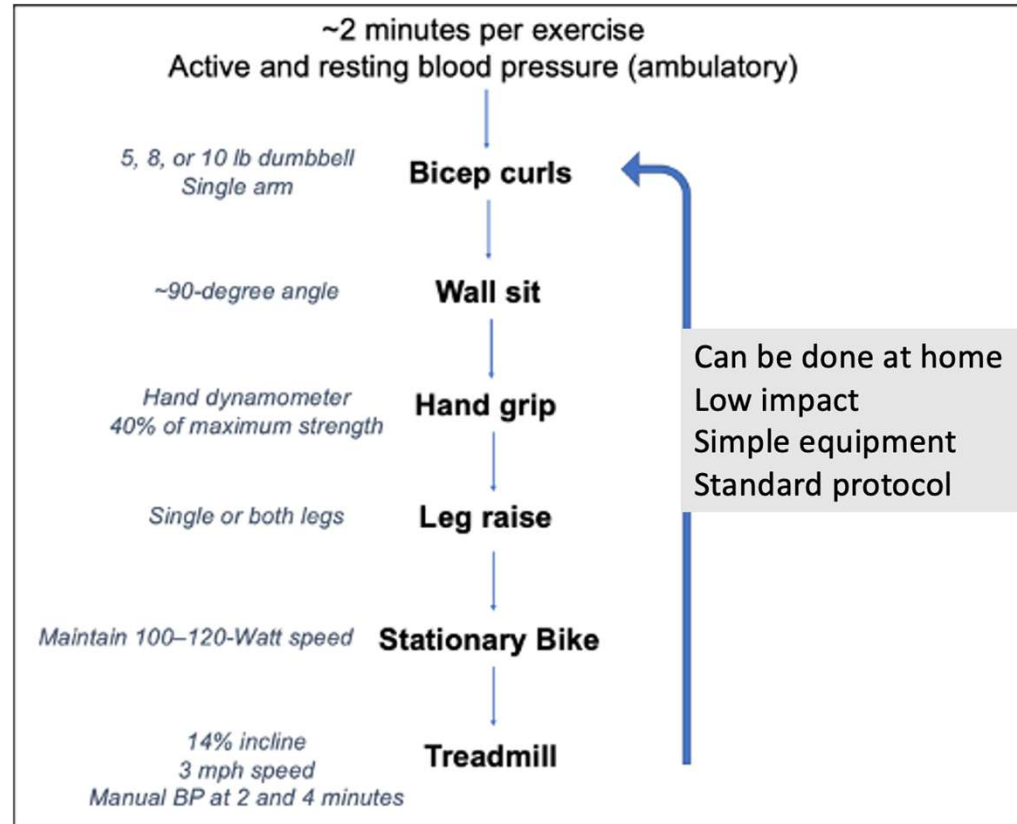
Guided feedback

Brace arm for BP

Free breathing

Borg 4-6 intensity

Stop before exhaustion



1	Very Light Activity (anything other than complete rest)
2-3	Light activity (feels like you can maintain for hours, easy to breath and carry on a conversation)
4-5	Moderate Activity (feel like you can exercise for long periods of time, able to talk and hold short conversations)
6-7	Vigorous Activity (on the verge of becoming uncomfortable, short of breath, can speak a sentence)
8-9	Very Hard Activity (difficult to maintain exercise intensity, hard to speak more than a single word)
10	Max Effort (feels impossible to continue, completely out of breath, unable to talk)

Characteristic	Guided Exercise, n = 44	Usual Care, n = 49	P
Age	56 (11)	57 (12)	0.7
Gender			
Female	15 (34%)	14 (29%)	0.6
Male	29 (66%)	35 (71%)	
Dissection Type			
Type A	31 (76%)	31 (65%)	0.3
Type B	10 (24%)	17 (35%)	
Intervention for dissection			
No intervention	5 (12%)	12 (24%)	0.3
Open Repair	32 (74%)	32 (65%)	
TEVAR	6 (14%)	5 (10%)	
Time since dissection (days)	1,098 (579, 2,014)	747 (425, 1,278)	0.1
Race			
Asian	2 (4.5%)	3 (6.1%)	0.2
Black or African American	5 (11%)	7 (14%)	
White	37 (84%)	32 (65%)	
Calculated BMI	28.2 (24.8, 31.6)	30.2 (26.5, 32.9)	0.1
Site			
STL	11 (25%)	8 (16%)	0.5
UMI	12 (27%)	17 (35%)	
UTH	21 (48%)	24 (49%)	

Characteristic	Guided exercise, n=44	Usual care, n=49	P
Anxiety T-score	52 (40, 56)	51 (40, 58)	0.9
Depression T-score	41 (41.0, 52.3)	48.9 (41.0, 52.2)	0.6
Physical function T-score	52.6 (45, 56.9)	48.2 (43.4, 56.9)	0.6
Fatigue T-score	49 (46, 53)	49 (40, 55)	0.5
Sleep disturbance T-score	51 (44, 54)	45 (44, 53)	0.2
Social T-score	54 (50, 60)	52 (47, 61)	0.6
Pain Interference T-score	53 (42, 56)	50 (42, 56)	>0.9
Physical Health Summary T-score	0.28 (-0.37, 0.71)	-0.05 (-0.63, 0.75)	>0.9
Mental Health Summary T-score	0.15 (-0.19, 0.60)	0.08 (-0.43, 1.03)	0.7
Moderate activities per week	6 (2, 7)	5 (3.7)	0.7
Vigorous activities per week	1 (0, 3)	1 (0, 4)	>0.9

Safety: Exercise after aortic dissection

No aortic dissections

No aortic operations

No deaths

1 in-person exercise session was temporarily paused due to SBP>200

1 right iliac artery dissection in a guided exercise participant

- *occurred at home and did not require intervention*

Blood Pressure: Exercise after aortic dissection

SBP > 170 mmHg (N)

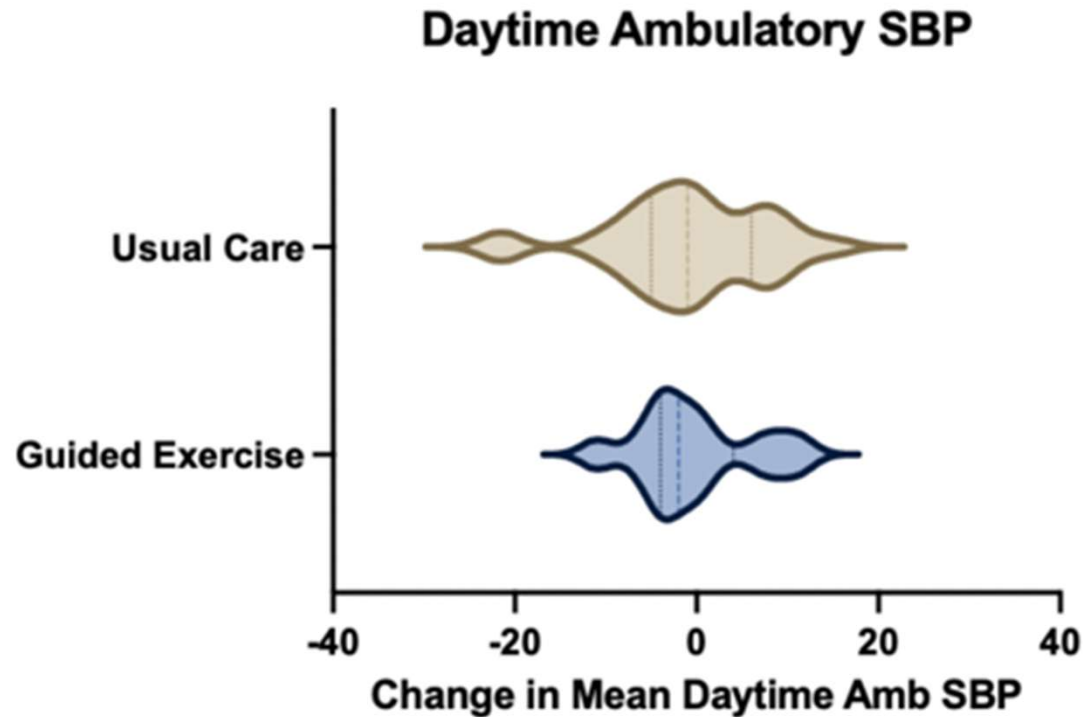
- Bicep curls: 6
- Wall sits: 10
- Hand grip: 6
- Leg raises: 3
- Bike: 5
- Treadmill: 8

SBP > 200 mmHg (N)

- Bicep curls: 0
- Wall sits: 4
- Hand grip: 0
- Leg raises: 1
- Bike: 0
- Treadmill: 1

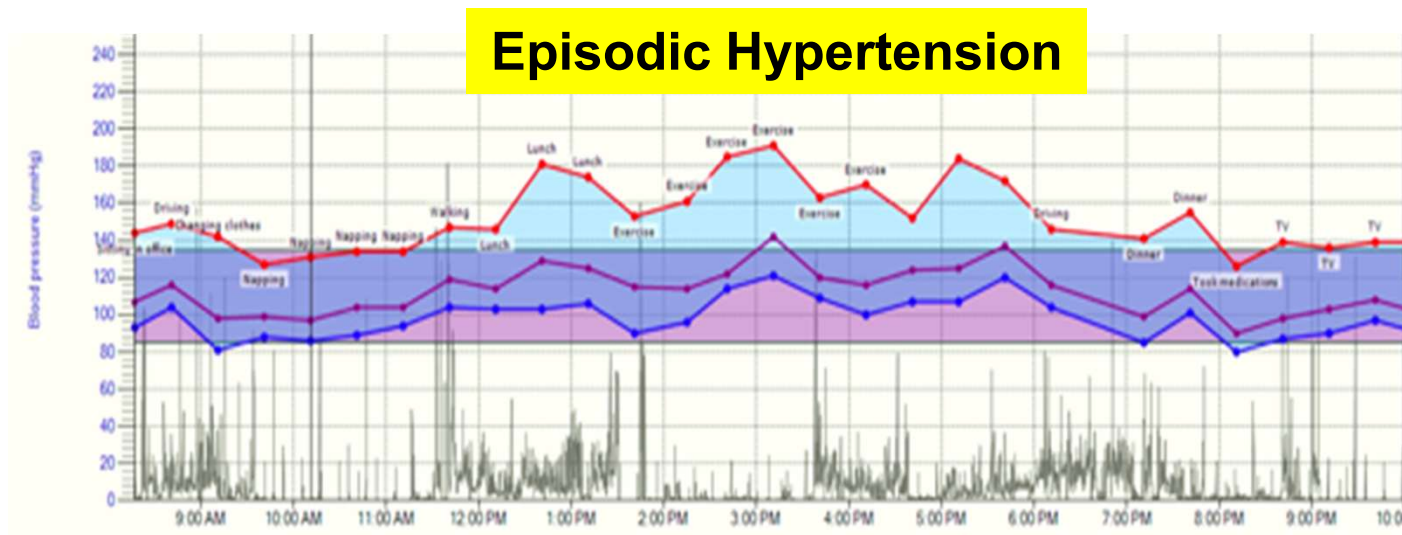
21%

Blood Pressure: Exercise after aortic dissection



Blood Pressure: Exercise after aortic dissection

- Blunted or reversed nocturnal dipping and ambulatory hypertension were frequent on ABPM, even with normal clinic BP
- ABPM, but not clinic blood pressure, predicted exertional hypertension



Variable	Total (n = 93)	Exertional HTN (n = 17)	No Exertional HTN (n = 27)	P
Mean SBP	118 (15)	122 (18)	114 (11)	0.11
Mean DBP	67 (11)	69 (10)	65 (6)	0.15
Day SBP	122 (18)	128 (17)	118 (14)	0.05
Day DBP	69 (12)	73 (14)	67 (6)	0.11
Night SBP	108 (18)	104 (24)	102 (14)	0.76
Night DBP	60 (13)	57 (11)	57 (5)	1.0
Peak daytime SBP	155 (26)	181 (37)	151 (20)	<0.01
Pulse pressure	51 (13)	54 (16)	48 (8)	0.17
Daytime SBP COV	11 (4)	14 (6)	11 (4)	0.08
Morning surge index (%)	16 (19)	19 (31)	16 (18)	0.72
Nocturnal dipping (%)	12 (11)	16 (7)	15 (11)	0.71

Lessons Learned

- Exercise is **safe** but experience and technique matters
- Observation and directed feedback can be effective
- Barriers to enrollment created bias and limited power
- We need to reach patients where they are:
 - 100% home-based
 - Frequent feedback and encouragement to prevent dropout
 - Apps and wearables for data collection
 - Target individuals who are unable to access rehabilitation
- We established infrastructure for future home exercise trials.

Principles for Safe Exercise

- Change “No!” to “How?”
- Informed shared decision making
- Agree on reasonable goals
- Supervision and instruction for safety
- Exercise is a vital sign: review at each visit

Resources For Safe Exercise

- [Marfan Foundation](#) Physical Activity Guidelines
- Cardiovascular Management of Aortopathy in Children: A Scientific Statement From the [American Heart Association](#)
- Webinars from the [John Ritter Foundation for Aortic Health](#)
- Results of this study will be published in *Circulation: Population Health and Outcomes*

Trial: Exercise after aortic dissection

Outcomes

Improved mental health

Reduced aortic stiffness

Lower blood pressure

Fewer future complications?

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& patients who participated in these studies.

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