# Activity Recommendations for Postaortic Dissection Patients

Ashish Chaddha, BS; Eva Kline-Rogers, MS, RN, NP; Elise M. Woznicki, BS; Robert Brook, MD; Susan Housholder-Hughes, MSN, RN, ANP-BC; Alan C. Braverman, MD; Linda Pitler, RN, MS, CCRC; Alan T. Hirsch, MD; Kim A. Eagle, MD

Individuals who have survived an aortic dissection are often faced with the question of how life can be maximally and safely lived, with functional independence preserved. Routine exercise is important for both physical and emotional health. During exercise, blood pressure and heart rate increase in part related to the intensity, duration, and specific type of activity performed. The goal of this Cardiology Patient Page is to provide the postaortic dissection patient with an understanding of how blood pressure changes with different activities. We will provide information to patients and families that leads to a greater sense of comfort during physical activity, while possibly decreasing the risk of future aortic complications, thus improving overall quality of life. It is our goal that patients will continue to engage in consistent exercise, given its beneficial effects on mental, physical, and emotional health.

## Handgrip Exercise

When a handgrip (Figure) is squeezed maximally for 1 minute, the systolic blood pressure (SBP) increases by approximately 50 mm Hg. The diastolic pressure increases by about 30 mm Hg.[1] When a handgrip is squeezed at 30% of maximal effort, the SBP increases by about 20 to 30 mm Hg, and the diastolic pressure increases by about 10 to 20 mm Hg. Although these studies are limited by small sample size, they do suggest that blood pressure may increase more than is appreciated during everyday activities requiring significant effort, such as carrying a heavy bag. The degree of increase in BP depends on how hard the handgrip is squeezed, with the increase being greater for maximal versus submaximal effort. Thus, for aortic dissection survivors, it is prudent to minimize carrying objects that are so heavy as to require a maximal or near maximal effort.

## Aerobic Exercise

The increase in BP during aerobic activity depends on the level of exertion. Metabolic equivalents (METs) refer to the intensity of the exercise. A more intense activity has a higher MET value (Table). For individuals with and without high BP, the SBP may increase by 8 to 12 mm Hg per MET of aerobic activity, with only a minimal effect on diastolic pressure. For example, SBP while running at 8 mph (13.5 METs) may increase by 108 to 162 mm Hg over resting levels whereas SBP may only increase by 26 to 40 mm Hg during brisk walking at 3 mph (3 METs). Thus, it is thought that a higher pressure may lead to a higher wall stress on the aorta, increasing the chance of a complication. It may be beneficial to take a cautious approach and limit activities that require extreme or maximal exertion (eg, running, sprinting), as well as activities such as chopping wood, shoveling snow, and mowing the lawn with a nonriding or non–self-propelled mower. The Table lists various activities and their corresponding MET value.

## Weightlifting

BP increased to about 230/165 mm Hg (from 130/80 mm Hg) when a biceps curl was performed with heavy weights for the maximum amount of repetitions



From the Cardiovascular Center, University of Michigan, Ann Arbor, MI (A.C., E.K.-R., E.M.W., R.B., S.H-H., K.A.E); the Cardiovascular Division, Washington University, St. Louis, MO (A.C.B.); the Thoracic Aortic Center, Massachusetts General Hospital, Boston, MA (L.P.); and the Cardiovascular Division, University of Minnesota Physicians Heart Practice, Minneapolis, MN (A.T.H.).

Correspondence to Ashish Chaddha, University of Michigan Cardiovascular Center, 6665 Crabapple Court, Troy, MI 48098. E-mail achaddha@med.umich.edu

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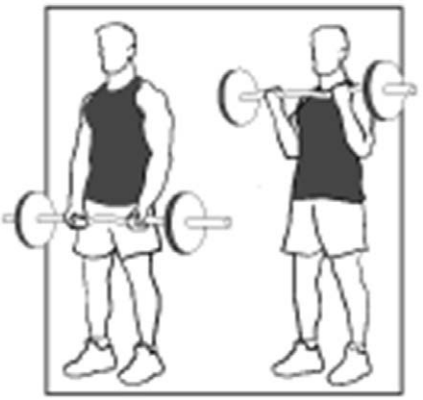

**Figure.** Illustration of various exercises. **A**, Handgrip exercise. **B**, Bicep curl.

possible (meaning failure was reached as even 1 more repetition could not be performed without rest), with heavy referring to a weight that is 90% of the 1-repetition maximum (a weight with which only 1 repetition can be performed). Using lighter weights (40% of the 1-repetition maximum) led to an even greater increase in BP if the maximum number of repetitions possible was performed.[3] Thus, when weightlifting, it seems that the greatest increase in blood pressure occurs when performing repetitions to the point that even 1 more cannot be performed, regardless of how light or heavy the weight is. Given this, it is important for the postaortic dissection patient to use a low amount of weight and to stop several repetitions before failure. These data may also suggest using caution and minimizing lifting heavy objects, with heavy being defined as objects that require a lot of effort and straining (such as a Valsalva maneuver) to lift.

## Daily Exercise Suggestions

Regular aerobic exercise may lower resting BP by a greater amount compared with weight lifting (3–8 mm Hg versus 2–3 mm Hg).[4] Lowering resting BP may reduce the chance of future aortic complications. High intensity exercise may not be necessary to receive these benefits.[4] The general health recommendation is to engage in aerobic activity at an intensity of 3 to 5 METs (moderate exertion), for at least 30 minutes on most days of the week, for a total of 150 minutes/week or more. Thus, walking, slow jogging, and recreational cycling at a casual pace may be sufficient if the goal is a reduction in resting blood pressure and improved cardiovascular health, while possibly minimizing the risk of aortic complications. We also recommend

**Table. MET Values For Various Exercise and Daily Activities[2]**

| Activity | Metabolic Equivalents |
|---|---|
| Lying quietly | 1.0 |
| Riding in a vehicle | 1.0 |
| Sitting and doing light activity | 1.5 |
| Playing the accordion | 1.8 |
| Walking slowly, <2 miles per hour (mph) | 2.0 |
| Gardening, light | 2.0 |
| Playing the flute | 2.0 |
| Playing the piano | 2.3 |
| Playing the cello | 2.3 |
| Horseback riding (horse is walking, not running) | 2.3 |
| Billiards | 2.4 |
| Canoeing at a slow, leisurely pace | 2.5 |
| Playing the violin | 2.5 |
| Watering plants | 2.5 |
| Aerobic/ballroom dancing at a slow, leisurely pace | 2.9 |
| Taking out the trash (not too heavy) | 3.0 |
| General house cleaning | 3.0 |
| Loading/unloading car | 3.0 |
| Walking the dog | 3.0 |
| Walking briskly, 3 mph | 3.3 |
| Mopping the floor | 3.5 |
| Vacuuming | 3.5 |
| Household tasks requiring moderate effort | 3.5 |
| Heavy yard work or gardening | 4.0 |
| Climbing stairs | 4.0 |
| Bicycling, casual, <10 mph | 4.0 |
| Raking lawn | 4.0 |
| Golf (without cart, carrying heavy bag of clubs) | 4.4 |
| Swimming at a slow pace | 4.5 |
| Dancing (ballet or modern) | 4.8 |
| Chopping wood | 4.9 |
| Snorkeling | 5.0 |
| Tennis (doubles) | 5.0 |
| Competitive ballroom dancing, fast | 5.5 |
| Square dancing | 5.5 |
| Ice skating | 5.5 |
| Mowing the lawn with hand mower | 5.5–6.0 |
| Shoveling snow | 6.0 |
| Competitive aerobic dancing | 5.0 |
| Ballet | 6.0 |

(*Continued*)

**Table. Continued**

| Activity | Metabolic Equivalents |
|---|---|
| Surfing | 6.0 |
| Roller skating | 6.5 |
| Skiing, downhill | 6.8 |
| Climbing hills (not carrying a load) | 6.9 |
| Strenuous hiking | 6.0–7.0 |
| Rowing/kayaking | 6.0–8.0 |
| Bicycling 10–16 mph | 6.0–10.0 |
| Climbing hills (carrying a 5-kg load) | 7.4 |
| Swimming, moderate or fast pace | 7.0–8.0 |
| Tennis (singles) | 7.0–12.0 |
| Jogging (10 min mile pace) | 10.2 |
| Skipping rope | 12.0 |
| Squash | 12.1 |
| Running, 8 mph | 13.5 |

weightlifting using a very low amount of weights, given its positive effect on strength and bone mineral density, but encourage patients to avoid straining and to stop well before fatigue.

## Sexual Activity

Sexual activity has only a moderate effect on BP and HR among healthy individuals. The greatest increase in blood pressure during sexual activity occurs at orgasm, with an increase in SBP of 40 mm Hg. The BP normalizes within 2 minutes. A common sense approach to sexual activity, avoiding straining or maximal exertion, may be safe for the postdissection patient.

## Conclusion

Routine physical exercise performed at a safe level is important for all individuals, including the patient after aortic dissection. It is prudent for postaortic dissection patients to minimize carrying objects that are so heavy that one has to strain or squeeze. It may also be important to avoid maximal exertion during aerobic activity (eg, running, sprinting). We recommend aerobic exercise at mild to moderate exertion (3–5 METs), for at least 30 minutes on most days of the week, for a total of 150 minutes/week, if the goal is a reduction in resting blood pressure and improved cardiovascular health, while possibly minimizing the risk of aortic dissection. If weightlifting is performed, we recommend using small amounts of weight and stopping several repetitions before failure, which will avoid straining. We suggest a common sense approach to sexual activity by avoiding straining, intense physical activity, or performance leading to shortness of breath. Because the response of BP and HR to exercise may vary widely among different individuals, one may consider low-level exercise testing or monitoring BP and HR during activity to ensure safety. Lastly, we encourage patients to discuss their activity concerns with the clinicians monitoring their cardiovascular health.

## Disclosures

None.

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