Aortic Diseases: Tips for Promoting Medication and Exercise Compliance

Strategies to help counsel aortic disease patients on medications and exercise recommendations to build confidence and improve long-term compliance.

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Aortic diseases, including thoracic and abdominal aortic aneurysms and aortic dissections (ADs), require lifelong expectant management to prevent life-threatening complications such aortic rupture or arterial malperfusion. Medical therapy and exercise are the cornerstones of nonoperative aortic disease management. Before starting any exercise program, a thorough evaluation is required to identify a patient's individual level of risk and to develop optimal, evidence-based recommendations for physical activities. The first step is to ensure that the patient is on the right medications. For aortic disease patients, the current major goal of medical therapy is to ensure that the average systolic blood pressure (SBP) over a given 24-hour period is < 130 mm Hg.[1]

Individualized exercise prescriptions may be beneficial to high-risk patients with surgically repaired aortic disease or heritable aortopathies such as Marfan syndrome. Exercise recommendations must account for aortic size, the rate of disease progression, and the presence of risk factors such as uncontrolled hypertension or a family history of AD while being acceptable to patients who will commit to a regular exercise program. Regular aortic imaging is essential to track disease progression and update exercise recommendations periodically, as aortic disease may evolve over time. All of this requires buy-in from the patient and a good collaborative working relationship with the clinician. Recognizing that all patients and providers have individual preferences, this article reviews a few methods that may help to improve long-term compliance with an aortic health regimen.

KNOWLEDGE AS POWER: COUNSELING FOR MOTIVATION

Aneurysms are typically defined as dilation of a particular aortic segment to more than 1.5 times the "normal" diameter, but there are many complexities that may be difficult for patients to interpret without help from their aortic specialist. For example, the normal size of the aorta varies with age, body size, and sex, which can be accounted for by indexing the absolute diameter of aortic segments to any or all of these factors using methods such as Z-scores.[1] Even if two patients have the same relative aortic size, surgical intervention may be warranted sooner if one of them has a high-risk feature such as a genetic syndrome or a congenital aortic disease caused by a highly penetrant genetic variant. If patients are counseled about the status of their aortic disease, they may be more motivated to adhere to follow-up visits and take medications. This motivation can work positively ("You controlled your BP, and your aorta did not change! Great job!") or negatively ("The size of your abdominal aortic aneurysm has increased. Your situation is serious, but there is still time to slow down the progression of your disease and maybe prevent the need for surgery. It will be very important for you to take steps to control your BP and lose weight").

MEDICATION COMPLIANCE: START LOW AND GO SLOW

We recommend that all aortic disease patients take medications for two reasons: to prevent AD and slow the rate of aortic dilation. Most clinicians quickly realize that no two patients experience a new medication in quite the same way. Ensuring compliance to medical therapies requires rec-

ognizing the individuality of patients and establishing trust with each patient, beginning before the first dose of medication is even administered.

Risk Assessment: Determine the Aortic Trajectory

Our first step to address these challenges is to link the potential benefit of a medication to the current status of aortic disease and predicted risk for complications (the "aortic trajectory"), updating this information at every subsequent visit.

Medication Side Effects: Prepare Patients for What to Expect

We counsel the patient about the potential side effects of a new medication and provide a direct contact method for the patient to report complications that will be answered promptly. We generally send a brief note directly to the patient about the new medication that is also recorded in the medical record. This strategy can often reduce alarm or a sense of betrayal in aortic disease patients who may already be anxious about their prognosis and feel unprepared when side effects occur.

Medication Dosing: Go Slow

We begin with the lowest possible dose of a new medication and send ourselves a reminder to check in with the patient after a few weeks. In clinical trials, the greatest benefits of ß-blockers or angiotensin receptor blockers were seen in aortic disease patients who were taking moderate to high doses of those medications.[2] Therefore, we always set a goal with the patient to increase the dose of each new medication within 1 to 3 months of the start date after ensuring that they are doing well.

Medication Follow-Up: Make Use of At-Home BP Monitoring

Finally, we ask every aortic disease patient to check their BP at home and counsel them extensively about recommendations for home BP measurements (a properly sized arm cuff, bracing the arm, feet flat on floor) when we start a new medication. This has direct benefits to the clinician to titrate the dose of medications more efficiently or troubleshoot new symptoms that may be caused by BP fluctuations, but it also allows patients to take ownership of their medical journeys while they directly observe the benefits of a new medication to reduce their SBP toward the treatment target. When there are discrepancies between self-reported and clinic BPs, we use 24-hour ambulatory BP monitoring or treadmill exercise testing to confirm that BP is adequately controlled. By repeating these steps over time, clinicians can establish effective individual therapeutic relationships with patients to reinforce medication compliance.

HEALTHY EXERCISE: BENEFITS OUTWEIGH RISKS

We recommend regular exercise to all of our aortic disease patients, because exercise provides numerous benefits, including improved cardiovascular fitness, reduced frailty, and improved BP control. The general consensus of clinicians is to prefer aerobic exercise, which is characterized by gradual increases in BP, over isometric exercises such as weightlifting, which can provoke dangerous spikes in BP. We also advise prioritizing light- to moderate-intensity activities over intensive exercise to the point of exhaustion, which are usually related to competitive training or contact sports.[1] Low- to moderate-intensity activities improve cardiovascular health and mental well-being without causing acute fluctuations of SBP that may increase the risk for AD or rupture. Our studies found that aortic disease patients who engaged in many different types of regular, moderate activities did not experience complications and had lower BPs during exercise.[3] With the right approach, consistent exercise can improve health outcomes without endangering aortic disease patients. Recognizing that anxiety about exercise is rampant, especially for patients who have survived ADs, we emphasize the published facts about exercise safety when we bring up the importance of exercise with patients.

Another major impediment for many aortic disease patients is uncertainty about how to monitor themselves during exercise. What signs and symptoms should they watch out for? How do they know when to stop exercising? Can they rely on a heart rate monitor to adjust their activity level? Fortunately, there are a few strategies that can help patients adapt to a new exercise prescription.

The Rate of Perceived Exertion (RPE) Scale

The Borg RPE scale is an effective and intuitive way for patients to regulate their exercise intensity.[4] We endorse the modified RPE scale, which is intended for self-assessment of effort and ranges from 0 (no effort) to 10 (maximum effort).

For patients with aortic disease, staying within an RPE range of 4 to 6, consistent with moderate exertion such as brisk walking, cycling, or swimming, can provide significant cardiovascular benefits and is safe. The RPE scale may be particularly useful for patients who take ß-blocker medications, because "heart rate zones" based on data from healthy individuals may not reflect their actual level of exertion. The use of an RPE scale empowers patients by providing real-time feedback to inform adjustments to exercise intensity that can minimize physical strain or fatigue and moderate BP responses. This approach encourages active participation in a healthy lifestyle while maintaining safe limits.

Reassuring Patients About Exercise

One of the most significant quality-of-life challenges for aortic disease patients is overcoming anxiety and fear related to exercise or simply leading an active life.[5,6] There are effective methods to encourage patients to begin exercising and reinforce positive feedback when patients are attempting to adhere to a new exercise program:

- **Be prepared.** Before the patient begins exercise, make sure they understand the severity of aortic disease and the importance of controlling risk factors such as hypertension by adhering to a thorough surveillance strategy and individualized medical therapies.
- **Supervision is key.** When starting to exercise, direct observational feedback is truly essential, because exercise programs are most effective when they are personalized based on cardiovascular fitness, exercise technique, and musculoskeletal stability. We refer all individuals who are recovering from surgery or AD to cardiopulmonary rehabilitation centers where they can receive goal-directed, personalized instruction on exercise techniques and home exercise prescriptions. Recognizing that access to rehabilitation is limited, we also encourage patients to think about alternative movement specialists such a personal trainer or physical therapist. These professionals can observe exercise technique and provide focused feedback to aortic disease patients who may feel vulnerable when they begin to exercise. Even temporary supervision, as short as 4 to 6 weeks, can result in long-lasting adherence benefits. Patients with large aneurysms that are close to elective surgical thresholds or another high-risk feature such as hypertension or syndromic aortopathy may require closer monitoring and adjusted recommendations. In these scenarios, communication between multidisciplinary care team members (surgeon, cardiologist, movement specialist) plays a significant role in developing safe, personalized exercise recommendations.
- **Follow up and expect accountability.** We view the amount and type of activities that our aortic disease patients engage in as another vital sign. Monitoring exercise capacity and exertional symptoms can provide an early warning of disease progression prompting a reevaluation or change in therapies. Patients also benefit by feeling more accountable when they recognize that their clinicians prioritize exercise and activity on an equal footing with medications and other aspects of aortic health care.

STAYING ACTIVE WITH AORTIC DISEASE

With guidance from their aortic care team and tools such as the RPE scale, aortic disease patients can build confidence and improve their compliance with regular exercise. Light to moderate aerobic activities such as walking, swimming, and cycling increase cardiopulmonary fitness and may even protect the aorta from dilation or dissection.[7] Regular follow-up, thorough surveillance, and personalized medical therapies are essential to reinforce healthy behaviors and keep patients safe. Every health care interaction is an opportunity to promote the safety and efficacy of exercise as an essential component of aortic health. ■

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