



# Pathology of Atrial Fibrillation and Methods for Testing and Prescribing Exercise

Abby Callahan & Logan Barrett  
Gardner-Webb University



# Introduction

Atrial fibrillation is one of the most common arrhythmias which is diagnosed to nearly 450,000 Americans each year (CDC, 2021). Atrial fibrillation is a conduction defect of the atria and is often characterized as an irregular heart rate that often causes poor blood flow. Atrial fibrillation is commonly associated with very rapid and chaotic atrial depolarizations that result in an irregular and sometimes rapid response of the ventricles (Jacobs, 2018). This condition can potentially have no symptoms, but when symptoms do appear they can include shortness of breath, fatigue, and palpitations. Treatments of atrial fibrillation include blood thinners, minimally invasive surgery such as an ablation, and cardioversions which are electrical shocks.

## Exercise Testing

Test are used to screen patients for myocardial ischemia or evaluate chronotropic responses during exertion (Keteyian et. al, 2019). The most common ways to test for Afib is by conducting an ECG or a stress test. An ECG can be performed during physical activity or during rest. A stress test is performed to determine how well your heart works during physical activity due to exercise making one's heart pump harder and faster a stress test can reveal problems with blood flow within the heart (Mayo Clinic, 2022).

## Exercise Prescription

Individuals who have atrial fibrillation have a reduced tolerance for exercise, but the extent to this reduction depends on the severity of any coexisting heart disease. Due to safety reasons and variability, it is recommended that clients seek a graded exercise test under the supervision of a medical professional to provide information for exercise prescription depending on the perceived exertion and ventricular responses to exercise (Jacobs, 2018).

- Aerobic exercise recommendations include large muscle group activities such as cycling, walking, or running at an intensity assessed by RPE of 13 to 16 out of 20, which correspond to workloads of 50% to 85% of peak  $\text{VO}_2$ . Exercise may be performed four to seven days a week with either accumulated or continuous durations of 30 to 60 minutes per day (Jacobs, 2018).
- Resistance training may be performed with a circuit weight training format and moderate intensity with 8 to 10 exercises performed between 40% to 80% of a person's 1RM. Like other cardiovascular conditions, performance of activities of daily living for the client with atrial fibrillation should be encouraged throughout the day (Jacobs, 2018).
- For the properly screened client, high-intensity interval training may be suitable and valuable for increasing training outcomes.

Parameter	Guideline
Frequency	4-7 days per week
Intensity	50-85% VO <sub>2</sub> peak; or 13-16 RPE (on Borg 6- to 20-point scale)
Mode	Activities that engage large muscle groups such as walking, jogging, or cycling
Duration	30-60 minutes per day of continuous or accumulated activity

Parameter	Guideline
Frequency	2-3 days per week
Intensity	Light to moderate; 40-80%
Repetitions	10-15
Sets	1 set per exercise in circuit format
Rest periods between sets	≤ 30 seconds
Exercises	8-10

## Special Considerations

Patients that live with Afib have a heart rhythm that is rapid and irregular with no distinct pattern. Afib occurs due to conditions of disorder impulses across the AV node to the lower ventricles and can result in atrial contractions that affect cardiac output and vulnerability for blood clots to form (Cantillon, 2018). Patients who exercise with Afib have a higher risk of their heart rates speeding up and if that occurs it could eventually lead to heart failure. Exercise capacity is 15-20% lower and peak heart rate is higher in patients with Afib than in patients with sinus rhythm (Keteyian et. al, 2019). Patients with Afib have a reduced exercise tolerance so they are recommended to seek medically supervised help to be given information on what exercises to preform. Exercises that the patients are recommended to preform are to be assessed by an RPE of 13-16 and workloads of 50% to 85% of peak VO<sub>2</sub> (Jacobs, 2018). Circuit weights are to be preformed in the format of 8 to 10 exercises between 40% to 80% IRM (Jacobs, 2018). The exercise professionals should pay attention to the ventricular response that makes the heart rete unreliable by a rating of perceived exertion (Jacobs, 2018).

## Conclusion

Afib is a conduction defect of the atria that is associated with chaotic and very rapid atrial depolarizations that can result in irregular and rapid ventricular responses (Jacobs, 2018). Individuals can live with their heart rhythm being Afib. Exercise is known to be beneficial to overall health by increasing cardiopulmonary and skeletal muscle fitness. Exercise is safe for patients with Afib, but it is safe to stay away from sports that involve contact and collisions due to a higher risk of bleeding (Cataldo, 2022). Afib has the potential to reduce exercise capacity due to the reduction of atrial contribution to the stroke volume and cardiac output. Patients with Afib have a higher risk of having heart failure. Afib can be treated with medications that are able to prevent clot formation, slow the conduction of the AV node, and decrease the ventricular response (Jacobs, 2018).

## References

- Bjerkedal J., Ehmken J.K., Fuller B. & Pavlov Q. (2019) Exercise Testing and Rehabilitation Recommendations for Patients With Atrial Fibrillation. *Journal of Cardiopulmonary and Respiratory Therapy*, 3(2), 65–72. <https://doi.org/10.1087/jccr.0000000000000043>
- Catalano, D. L. (n.d.). Resource detail: Afib ACSM. Retrieved April 22, 2022, from <https://www.afib-acsm.org/afib-resources/trending-topics>
- Jacobs P. L. (2018). *Afiba's Essential Training Special Populations Human Kinetics*.
- Mayo Foundation for Medical Education and Research. (2021, June 3). Stress test. Mayo Clinic. Retrieved April 22, 2022, from <https://www.mayoclinic.org/diseases-conditions/stress-test/symptoms-causes/syc.200282>
- Cartillon, D. J., & Amuthan, R. (2018, August). *Austral Atrial Fibrillation*. Retrieved April 22, 2022, from <https://www.austrialfibrillation.com.au/>
- Photos:
- <https://www.shutterstock.com/image-vector/heart-rate-line-graph-vector-illustration>
- [https://www.alphajournal.org/article/S2468-2704\(21\)00130-X](https://www.alphajournal.org/article/S2468-2704(21)00130-X)
- <https://www.conceptart4all.com/artists/2011/01/01/stock-Flyby/>
- <http://www.secondcircle.com/en/magazine/article?seid=35f8ff3d-5c08-435e-8742-47a0c08813e8&crid=5776865117680000>
- Tables:
- Jacobs P. L. (2018). *Afiba's Essentials of Training Special Populations*. Human Kinetics.