



## HEART RATE VARIABILITY BIOFEEDBACK

Heart Rate Variability (HRV) Biofeedback triggers very powerful reflexes in the body that helps control the Autonomic Nervous System (ANS). This part of the nervous system is involuntary and controls functions such as heart rate, blood pressure, and breathing. The ANS is separated into two branches: the sympathetic nervous system and the parasympathetic nervous system. The sympathetic nervous system is also known as the “fight-or-flight response” and the parasympathetic nervous system is also known as the “rest-and-digest or relaxation response”. The parasympathetic nervous system is also responsible for initiating the healing response in your body. Both branches work together to create changes in your heart rate.

The sympathetic branch accelerates your heart rate to prepare you for emergencies like fighting or fleeing a saber-tooth tiger. Think of the sympathetic branch as your heart’s gas pedal. In contrast, the parasympathetic branch slows your heart rate when you eat a meal, fall asleep, and when you are feeling relaxed. Think of the parasympathetic branch as your heart’s brake. When you inhale, you take your foot off the parasympathetic brake and your heart rate accelerates. When you exhale, you press down hard on the parasympathetic brake and your heart rate slows. This change in heart rate occurring along with respiration is called Respiratory Sinus Arrhythmia (RSA). The rhythmic change in your heart rate with your breath is called Heart Rate Variability (HRV).

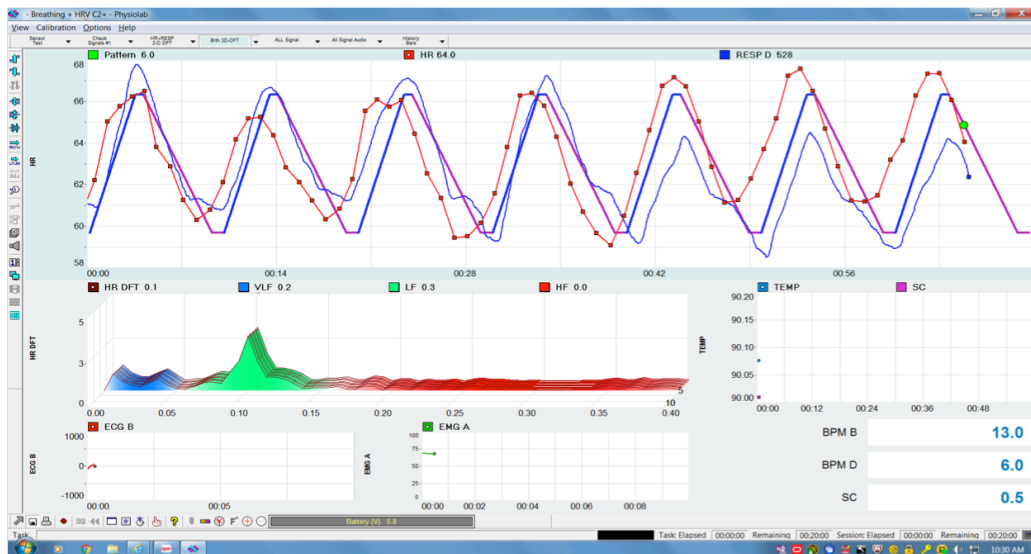
A simple measure of HRV is the difference between your fastest and slowest heart rate. Heart-rate variability is also a measure of the amount of parasympathetic activity. When there is high HRV there is stronger parasympathetic activity. When there is low HRV there is stronger sympathetic activity. A healthy heart exhibits a high HRV by adjusting

automatically to internal and external stimuli. High HRV represents a flexible autonomic nervous system, responsive to the needs of the body at any given moment. Low HRV on the other hand generally represents a less flexible autonomic nervous system, unable to shift gears and respond to dynamically changing stimuli. Low HRV has also been identified as a significant risk factor for disease.

The fight-or-flight response is activated when we feel threatened by something in our environment and helps prepare our body for either running away from or fighting the threat. We evolved this response so that we could survive major threats to our life, such as being attacked by a predator. However, in modern times these major types of life-threatening situations are less common. Instead, it is more likely that the fight-or-flight response is triggered by everyday stressors, such as traffic, school or job performance, and social situations. For example, a common reaction to giving a presentation to a large group of people is: feeling nervous, quick/shallow breathing, rapid heart-rate, cold/clammy hands, and having butterflies in your stomach. This physical reaction is activation of the flight-or-flight response, which speeds up your heart-rate and breath-rate, increases sweat, and decreases body temperature. In addition, other body functions, such as digestion are not as important in that moment and are disrupted since it is not necessary for survival. Therefore, a lot of people also report difficulties with digestion, such as stomach pain, gas, constipation, and diarrhea when feeling stressed or anxious.

Many people are very stressed or anxious, and dealing with constant daily stressors resulting in chronic activation of the sympathetic nervous system/fight-or-flight response. As a result, there can be serious consequences, which can range from anxiety disorders, panic attacks, depression, muscle tension, pain, headaches, sleep disorders, digestion/GI issues, respiration problems, suppressed immune functioning, and potential exacerbation of prior medical conditions. Fundamentally, all of these problems are created by an imbalance between the sympathetic and parasympathetic nervous system. Through HRV Biofeedback, we can treat the over-activation of the sympathetic nervous system by rebalance in the ANS and strengthening the parasympathetic nervous system.

During a biofeedback session, equipment measures HRV and provides the participant with information about changes in heart rate that accompanies breathing. With this information participants learn how to influence the reflexes that regulate the autonomic nervous system. This technique helps the body to function more efficiently, improving overall health and ability to manage everyday stress. Biofeedback has been proven to treat stress related physical symptoms such as panic attacks, headaches, dizziness, stomachaches, gastrointestinal issues, chest pain, autoimmune disturbances, chronic pain, and insomnia.



We will use a slow-paced diaphragmatic breathing while we monitor your body with the equipment in order to strengthen parasympathetic activity and bring the autonomic nervous system back into balance. You can maximize heart rate variability when you breathe from 5-7 breathes per minute. Typically, people breath about 12-15 breathes per minute when sitting quietly. You are able to maximize HRV with slower-paced breathing because it combines the effects of your autonomic nervous system, blood pressure control ECG system, and respiratory system on the variability of your heart rhythm. Using diaphragmatic breathing, it is easier to breathe at a slower pace, which will stimulate parasympathetic activity and decrease symptoms of anxiety, panic, depression, and stress-related physiological symptoms.

Using the computer biofeedback equipment we can see the immediate effects of diaphragmatic breathing on your body. We will find a breathing pace that works best for you. You will be required to practice at this pace daily in order

to receive the maximum benefits. Each session you will be connected to the biofeedback equipment to see how you are doing with the breathing and track your progress. The main goals in biofeedback are to: (1) reduce symptoms, (2) balance your autonomic nervous system for prevention, and (3) for you to be comfortable enough with this breathing to use as a rescue technique during stressful situations. Maximizing your heart-rate variability triggers very powerful reflexes in the body that help it to control the whole autonomic nervous system (including your heart rate, blood pressure, and breathing). Increasing the size of the heart rate changes will exercise these important reflexes, and help them to control your body more efficiently. This will help you to improve your ability to manage everyday stress. This will allow you more freedom to enjoy your life and improve your overall health.

Call Dr. Starr MacKinnon for your free consultation to see if  
HRV Biofeedback is a good fit for you.  
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