



PRIDE Heart Rate Variability (HRV) Biofeedback

Your autonomic nervous system controls automatic functions in your body like blood pressure, heart beat, and digestion. There are two parts to your autonomic nervous system. The sympathetic side works like a gas pedal. It turns your stress level up. The parasympathetic side works like a brake. It turns your stress level down. When you are calm and relaxed, these two parts are balanced. When you are under stress, they become imbalanced, which can result in negative physical symptoms.

Your autonomic nervous system is constantly trying to stay in balance. It's like a thermostat on the wall that is set to 72 degrees in the summer time. Every time the temperature gets too hot, the air conditioning turns on and cools the room back to 72 degrees. In this way, the temperature remains pretty constant. All of the systems in your body try to maintain balance in a similar way.

The more flexibility in your autonomic nervous system, the easier it is to maintain good balance. An inflexible nervous system has more difficulty restoring balance when you are under stress. One way to measure the flexibility in your nervous system is with heart rate variability (HRV). Experts have found that your heart is not designed to beat in a very steady pace. A healthy heart shows variability, so that differences can be measured in the space between each heart beat. When analyzing these spaces between heart beats, a computer can identify 3 different frequency waves. One of these waves, called low frequency waves, is associated with relaxation and autonomic nervous system balance.

Researchers have discovered that people can increase HRV and low frequency waves by breathing at about 6 breaths per minute. Researchers believe that by practicing paced breathing, people can increase the flexibility in their nervous system and make it

easier for it to stay balanced and calm. Research has shown that regular practice of paced breathing can result in improvements in a number of disorders, including high blood pressure, asthma, and depression. People who practice paced breathing usually report that they feel more calm and relaxed. People with chronic pain conditions often report that paced breathing helps with pain control.

Below is a biofeedback graph demonstrating HRV. The smooth line at the top shows a breathing pattern of about 3 breaths on this 30-second screen (which is 6 breaths per minute). The red jagged line below the breathing shows the HRV pattern as the heart speeds up and slows down with each breath. The graph at the bottom is measuring the frequency waves in the heart rate pattern. Notice the green area that is rising up at 0.10 hertz. These are low frequency waves. The heart rate pattern and low frequency waves are being generated by this specific breathing pace. With breathing practice, you can gain increased skill with creating this HRV pattern. This skill can help you manage stress and other symptoms, and regular use may help improve your general health.

