

Biofeedback Matters®



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Heart Rate Variability Biofeedback

Volume 9, Issue 2



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A day at Sesame Place
with grand daughter Arian



Heart Rate Variability Biofeedback is one of the most popular modalities in recent time.

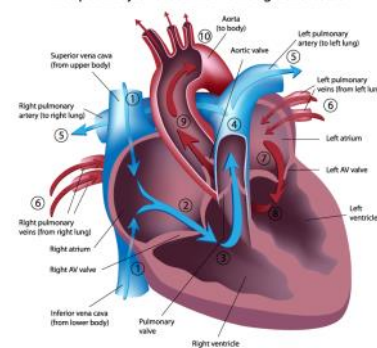
It can be done with one channel using a plethysmograph sensor that goes on the finger or earlobe or a set of EKG sensors that are placed on the chest, abdomen, or wrists. Many of the lower cost systems use

a plethysmograph sensor. They are designed to be used by professionals or non professionals. They are usually relatively simple to use with pleasant user interfaces. They don't tend to give detailed or complex data in their reports. An EKG or electrocardiograph sensor is usually only included in professional systems. Manufacturers usually don't use EKG sensors in home devices

because the sensors are more difficult to apply.

These systems give feedback on heart rate and also some form of heart rate variability. On some software it is called coherence or smoothness.

The pathway of blood flow through the heart



With a system that has two channels it is possible to add a respiration sensor so that you can get feedback on breathing in addition to the other signals. This can be important because it allows you to directly see the relationship between how a person is breathing and their

heart activity. The systems that have this capability cost more because of the extra channel and sensor. Professional systems tend to have the capability of measuring respiration in addition to heart rate variability.

When I was introduced to biofeedback in 1984, heart rate variability wasn't a thing. Heart rate was sometimes measured. Increased heart rate was seen as a sign of stress reaction. Decreased heart rate was seen as a sign of relaxation. About twenty years ago at an AAPB (Association of Applied Psychophysiology and Biofeedback) I was introduced to heart rate variability by a company called HeartMath. They were selling a device at that time called the Freeze Framer. It used a plethysmograph sensor that clipped on the earlobe or wrapped around the finger and connected to a serial port on a

Pelvic Muscle Disorder



eVu TPS Finger Sensor with App for HRV, Temperature and Skin Conductance is only \$355 on sale for a limited time. Call 877-669-6463 for details.



U-Control U-Control is an easy to use single channel SEMG trainer to retrain pelvic floor muscles for incontinence. It enables users to self-train with prescribed exercises using either our vaginal, rectal or surface sensors. \$345

New Biofeedback & Neurofeedback Equipment Rental Program

We offer instruments for rent to practitioners or directly to your clients to make the process easier for you. Items available for rent include:

Thought Technology Procomp-2, Procomp Infinity

J&J GP-8, J&J GP-12

Heartmath EmWave Desktop

BioSignals HS and HS+ with Alive Software

BrainMaster 2E

Call us for details

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For most mental health providers the thought of pelvic muscle disorder biofeedback may not immediately be of interest. It is however an effective applications of biofeedback. For urinary incontinence it is rated at a level 3 on a scale of 1-5 for effectiveness according to Evidenced Based Practice in Biofeedback and Neurofeedback 3rd Edition (Tan, Shaffer, Lyle, Teo) (2016)

Although it is not what a mental health person would usually do, nurses and physical therapists are well equipped to perform this type of biofeedback. Even if you are a mental health provider and wouldn't do it yourself, you may have a person on your team who would.

This can fit well in a urology, gynecology, or obstetrician office as well.

PMD biofeedback involves the use of surface EMG. Even though a different type of sensor that is inserted in the vagina or rectum may be used I still refer to it as surface EMG since no needles are used to pierce the skin. Surface sensors may be used if avoiding inserting a sensor is preferable. This is not as specific since the sensors are not as close to the pelvic muscles that are to be recorded but it is still effective.

The EMG amplitude is recorded during an initial assessment. During the first part of the assessment the subject is instructed to relax for the baseline period. Next the subject is asked to contract quickly and then relax a few times then contract for a longer period

and relax. Then they are asked to contract and hold to measure endurance. Finally, they are asked to relax again for a post baseline. Several things are looked at in the data including: Were the muscles relaxed during baseline? Sometimes a person is chronically tensing their muscles unnecessarily causing fatigue so that when they do need to contract the muscles they are too weak to contract with enough strength. It is also important to see if the muscles can quickly contract strongly enough to prevent loss of urine including during a sneeze, cough, or laughter. Finally it is important to know if the muscles can sustain a strong contraction long enough to continue to stop the flow of urine. Sometimes a second channel of EMG sensors are placed on what are called accessory muscles like the abdomen or buttocks area. Some people contract these muscles instead of the pelvic muscles in error. Giving them feedback on the correct muscles and the incorrect muscles at the same time can help them



to focus and use the correct muscles more.

This can make doing the Kegel exercises that they are given as homework more effective. There are also home trainer devices that can be rented or loaned to the clients for home practice between sessions and after the series of office sessions are completed for continued prac-

tice. If you watch TV or listen to the radio, you have probably seen or heard commercials about adult diapers or special pads that are used for urinary incontinence. It is a big market. I've even heard commercials where a woman talks about having an accident if they laugh, cough, or sneeze as though it is a normal thing. Pelvic muscle biofeedback can often help with this type of problem.



We also had a hospital in New York City that does prostate surgeries tell their patients to order the home trainers to use after surgery to strengthen their pelvic muscles.

If you are a nurse or physical therapist or you work with or know any I suggest that you look into this form of biofeedback. You might even suggest it to people you know that could benefit from this therapy.



MyOnyx 4-Channel EMG & Stim System

Special limited time sale pricing

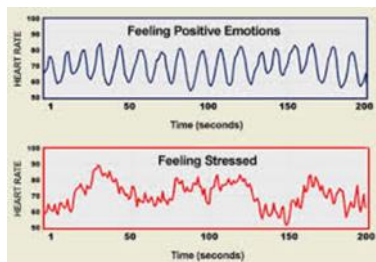
Mobile \$1,600, usually \$1,800

Clinical \$2,500, usually \$2,800

computer. That device has been replaced by the EmWave Desktop that connects to a USB port on a computer.

Giving feedback on the variation of heart rate was a new concept for me. It took me a while to grasp the idea that having the heart speed up and slow down was a good thing. Once I started to understand it, I could see how it made sense and I believed that it was going to be a big thing in biofeedback. Since then HRV biofeedback has really taken off. There are lots of applications for this modality including hypertension, asthma, insomnia, anxiety, trauma, PTSD, and peak performance.

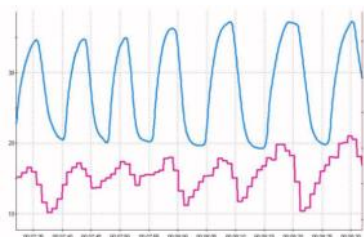
Because it is effective and relatively easy to use some biofeedback providers have started to use it exclusively and neglect using some of the other modalities that continue to have their place. I still believe that best practice is to perform a psychophysiological stress profile with all modalities and then de-



cide which ones are most appropriate for each client. Sometimes

it will be HRV, other times it may be another modality like surface EMG.

In any case HRV is a very effective and useful biofeedback modality. One of the things I like about it is that it is usually very easy for a per-



son to see a difference in their heart rate variability when they change their breathing. I like to record a baseline while the person is breathing the way they normally do first. This is hard to do if you tell them to breathe normally. Once you say that, they start to think about how they are breathing and are likely to adjust it to what they think it should be.

After recording how they usually breathe I like to ask them to shift to slower, somewhat deeper breathing sometimes using a pacer.

For most clients the contrast in heart rate activity after the shift in breathing is amazing and eye opening. They immediately “get” why how they breathe is so important. After seeing this evidence they are more likely to practice breathing exercises in

and outside of the therapy office.

The training for HRV biofeedback is fairly simple. The goal is to increase heart rate variability using one of several pieces of data as the signal. This is usually done with only relatively slow, paced breathing or this type of breathing with positive imagery added.

Some of the measurements used in HRV biofeedback include SDNN, the standard deviation of the normalized inter-beat interval (the R wave to R wave interval measured in milliseconds,) HR Max – HR Min is the difference between the highest and lowest heart rates during each respiratory cycle. The power of the Low Frequency (LF) band can also be used. There are Ultra Low, Very Low, Low, and High frequency bands.

The optimal training protocol for both asthma and cardiovascular health teaches clients to increase power in the low frequency (LF) band. Evgeny Vaschillo suggests that each person has their own resonant frequency that maximizes overall health. It can be produced by creating a “relaxed mental state, with a positive emotional tone, breathing diaphragmatically at about 6 breaths per minute” (Moss,2004).

There are many options for HRV biofeedback devices. I urge you to add this modality if you haven’t already. We will be adding HRV BCIA certification courses shortly.



Biofeedback/ Neurofeedback Seminar Schedule BCIA Certification Biofeedback

October 8-10, 2021

Hawthorne, NY

Online sessions

September 2, 9, 13, 16, 20, 23, 27

Fees: \$1,195

Neurofeedback

November 5-7, 2021

All dates Hawthorne, NY

Online sessions

October 18, 21, 25, 28, Nov. 1

Fees: \$995

Please visit

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Health Training Seminars is approved by the American Psychological Association to offer continuing education for psychologists and maintains responsibility for the program.





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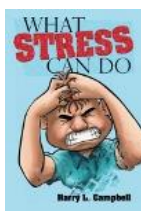


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Harry L. Campbell



Biofeedback Resources International offers online and onsite training options in addition to our in-person training sessions. Over the years we have had many people from all over the United States and other countries attend our in-person training sessions. We have had students from Canada, Brazil, Mexico, Spain, Turkey, Hong Kong, France, United Kingdom, Qatar, as well as other countries.

Even before Covid-19 hit, we have had requests for online training. During the shutdowns of person gatherings and legitimate fears and travel restrictions, requests for online training has increased. We began and continue to

offer online courses to fill the needs of those who either cannot or would rather not travel during this time and still want to get trained in biofeedback and neurofeedback while meeting the didactic training requirements for BCIA (Biofeedback Certification International Alliance) certification. This allows people all over the USA as well as international students to complete the training from home. Our onsite training is another option that can be a perfect fit for clients who need to have multiple students trained. If a client wanted to have several of their providers trained at one of our public in person sessions they would have to arrange and pay for travel and lodging in addition to paying the tuition for each person. That can get complicated and expensive. It also

means that all of those people are away from the physical office and home and are not available for any emergencies that often come up. It is much more convenient and cost effective for us to come to you and provide the training at the your site for a cost that ends up being less than it would if all of the students had to travel to us. We have been providing this training option for many years. Several Veterans Administration (VA) Medical Centers, US Military facilities, and group practices have taken us up on this option and it has worked out very well for them. Please contact us for a quotation and details for providing this for your organization.

