



SAGE SPACE
TECHNOLOGIES

Vibroacoustic Therapy: A BEGINNER'S GUIDE

GABRIEL ETTENSON, MSPT

Introduction to Vibroacoustic Therapy



*“Any sufficiently advanced technology is
indistinguishable from magic.”*

ARTHUR C. CLARKE

Vibroacoustic Therapy (VAT) is a technique that offers a diverse array of physical, emotional, cognitive, and even spiritual benefits. These benefits are achieved primarily through responses within the brain when the body is exposed to sound waves, a form of mechanical energy. There are two key processes whereby VAT works in the body, resonance and mechanotransduction.

- 1. Resonance:** Resonance in the human body occurs when the frequency of a sound wave interfacing with the body matches the frequency at which the body is vibrating as a result of the movement of the smaller particles comprising it. When resonance occurs, not only is the intensity of the vibration in the body enhanced, but there is a corresponding structural change at the cellular level. These two occurrences together cause a surge in bioelectric energy within the body which enhances communication within the brain and can promote many beneficial changes.
- 2. Mechanotransduction:** Mechanotransduction is the process by which mechanical energy from the sound waves are converted into bioelectric energy within the body, regardless of whether resonance occurs. It is an important process in the human body, allowing cells to understand how to adapt to changes in their environment. The process of mechanotransduction allows bones and muscles to change in response to exercise. While mechanotransduction emphasizes the conversion of mechanical energy into bioelectric energy, biochemical processes also occur as part of the body's physiological response to mechanotransduction.



With VAT, sound waves are delivered to the user through both a specialized device called a “sound bed” and a set of headphones. This powerful combination creates an immersive, therapeutic whole-body sound experience. Although VAT is certainly a form of sound therapy, its role in modern day medicine suggests it may be better described as a form of neuromodulation therapy. Neuromodulation therapy refers to the use of targeted electrical or chemical stimulation to beneficially alter the activity of the nervous system. These beneficial alterations in the brain occur through a process called neuroplasticity and allow for more optimal communication pathways to be solidified in the brain (“positive plasticity”).

Despite decades of successful use for various health-related issues, VAT has been somewhat challenging to understand for many western practitioners as it aims to integrate often disregarded principles of energy medicine with those of western medicine. However, as individuals and research communities seek to explore the periphery of western medicine in search of new ways to approach disease and health and wellness, interest in understanding the subtle science and medical potential of VAT is increasing.



The Science of Vibroacoustic Therapy



“If you want to find the secrets of the universe, think in terms of energy, frequency and vibration.”

NIKOLA TESLA

To understand how VAT works, it's crucial to consider its effects on two of the body's primary sensory systems; the touch/tactile system and the auditory system. While VAT acts on both systems through the same process, it's helpful to distinguish between them in our discussion.

As it relates to the touch/tactile system, the sound bed, equipped with transducers throughout it, transmits low frequency sound waves to specific areas of the body such as the legs, lower back, and neck. This is experienced as physical vibration. In these areas, there are specialized neurons designed to perceive information related to touch, including light touch and pressure. These neurons then deliver this information to the brain.

The auditory system receives sound waves through the ear, and like with hearing, transfers this information to the brain through internal structures called hair cells and their connection to the auditory nerve. In both of these cases, the resulting conversion of mechanical energy into bioelectric energy influences the activities of various neurochemical responses and therefore the communication in the brain.

When it comes to the actual information being converted by these specialized neurons during VAT, it is important to understand the two key elements of a sound wave. These are the frequency and amplitude of the sound wave. In general terms, the frequency of a sound wave pertains to its pitch while the amplitude pertains to its intensity, or the loudness of the sound. For this reason, amplitude ranges are often a more limited variable with VAT than frequency ranges due to the fact that the user may be more limited in the volume they can tolerate. Amplitude can also be limited by the specifications of the transducers used in the device as well.

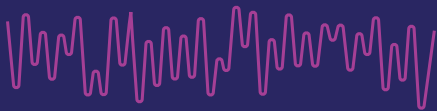
With frequency, what we perceive as a high-pitched sound (ex. cymbal) is a high frequency sound wave. Alternatively, a low-pitched sound (ex. bass drum) is a low frequency sound wave. When it comes to the therapeutic effects of VAT, it is often the careful selection of the sound wave frequencies used, or how those frequencies may differ from one ear to the other, that matters.

There are two key approaches to using sound wave frequencies therapeutically when it comes to VAT. These approaches are referred to as Brain Entrainment and Balancing Frequencies.



Brain Entrainment:

Brain entrainment is based upon brain wave frequencies. Measured through EEG, there are five widely recognized brain wave frequencies, all reflecting the electrical activity occurring within the brain during different states of consciousness:



Gamma brain waves

These are the fastest of the brain waves. The frequency range for gamma brain waves is 30-100 Hz. Gamma brain waves are associated with extremely elevated levels of brain activity and functional connectivity. If someone is in a state of intense concentration or possibly under the influence of certain psychedelics, gamma waves may be detectable.



Beta brain waves

These waves are the second fastest brain waves, typically between 12-30 Hz. Beta brain waves are associated with mental arousal, problem solving, or being in a highly anxious state where thought related to the past or future dominates.



Alpha brain waves

The frequency range of alpha brain waves is 8-12 Hz. An alpha brain wave state is typically associated with a feeling of calmness or being relaxed.



Theta brain waves

Theta brain waves are in the 4-8 Hz range and are associated with a more deeply relaxed, inwardly focused state. People in a meditative state may register theta brain waves.



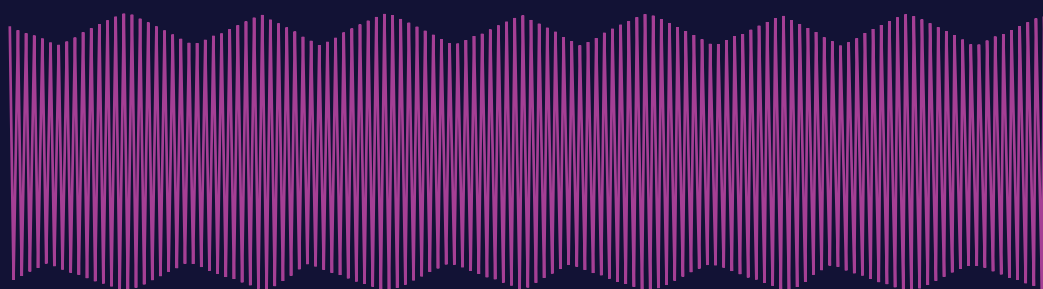
Delta brain waves

Delta brain waves are the slowest of all at 0.5 to 4 Hz. A delta state would be likely found in the stages preceding, during and proceeding sleep.



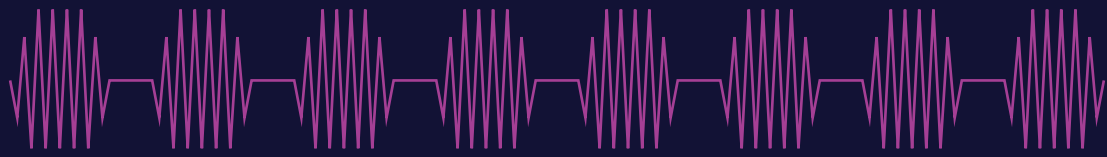
Considering the different brain wave patterns and the states of consciousness they reflect, it becomes obvious that the ability to move in and out of these brain wave states could be seen as an indication of being in good health. However, with modern day society's rising issues with sleep, high levels of daily stress, and challenges being able to focus, this fluidity seems quite impaired. One might say that western culture is mostly "stuck" in a beta state, where thinking dominates.

There are two techniques used for brain entrainment. They are referred to as binaural beats and isochronic tones:



Binaural Beats

With binaural beats, which require headphones in most cases, an intentional frequency discrepancy is engineered between the inputs coming into the right and left ears. This is referred to as an auditory illusion. The frequency of the auditory illusion is based upon the desired brain wave pattern the user hopes to synchronize or "entrain" the brain to. For example, an individual who may be in a somewhat anxious state may have the goal of feeling calmer. With binaural beats, you can engineer the soundtrack to start with 400 Hz in one ear and 415 Hz in the other. This creates an auditory illusion of 15 Hz. Initially, this would match a beta frequency so the listener will resonate more closely with the soundtrack. However, over the next 20-30 minutes, the music would slowly close the gap between the two ears so that the difference is only 10 Hz. With this adjustment to the lower frequency, the brain becomes entrained with the lower alpha frequency. The desired result of this is that the individual will slowly feel less anxious and calmer. This same process in the soundtrack engineering process can be used to target the experience of the other brain wave frequencies as well.



Isochronic Tones

Discovered much more recently are isochronic tones. Isochronic tones work similarly to promote a particular brain wave frequency. However, unlike binaural beats, isochronic tones are more easily described as a repeating, pulsing beat occurring at the specific frequency intended to be entrained. For this reason, isochronic tones can be less tolerable to people who want to listen to music. On the other hand, isochronic tones offer an option for people who have certain types of hearing impairments as they do not require both ears to be receiving input like with binaural beats.

It is important to mention that with brain entrainment programs, while the auditory system plays the largest role in the described effects, it is always important to connect the target brain wave frequencies with the frequencies passing through the transducers in the sound bed. In this way, the entire body receives the same message and aligns to the same effects.

Balancing Frequencies:

Unlike binaural beats and isochronic tones, balancing frequencies are not intended to work through the process of brain entrainment. Instead, balancing frequencies fall into the category of “healing frequencies” and work on the entire body. Balancing frequencies may range between 1-1000 hz. A commonly used series of balancing frequencies are referred to as Solfeggio frequencies.

Solfeggio frequencies are rooted in the analysis of common sound wave frequencies found in music historically used for ancient healing practices and more spiritually directed pursuits. Examples of music from which key Solfeggio frequencies are said to have been identified include Gregorian chants and the chanting of mantras in certain eastern traditions. The most commonly accepted Solfeggio frequencies and their proposed benefits are as follows:



- 174 Hz** - General physical health benefits
- 285 Hz** - Internal organ and wound healing benefits
- 396 Hz** - Reduced fear and feelings of guilt
- 417 Hz** - Promotes change in one's life path
- 528 Hz** - Promotes physical healing at a deeper level
- 639 Hz** - Improves relationships
- 741 Hz** - Promotes creativity and problem-solving
- 852 Hz** - Promoted the exploration of consciousness and intuition
- 963 Hz** - Supports the process of gaining enlightenment

Like isochronic tones, Solfeggio frequencies can be challenging to listen to in isolation. For this reason, Solfeggio frequency soundtracks are typically mixed with other frequencies to improve the listener's experience. Outside of Solfeggio frequencies, many lower range balancing frequencies below 100 hz have been used in research for various physical, emotional, and cognitive benefits.



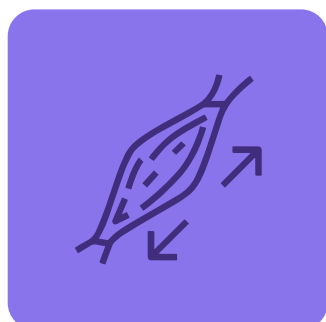
The Research-Based Benefits of Vibroacoustic Therapy



"Just as certain selections of music will nourish the physical body and your emotional layer, so other musical works will bring greater health to your mind."

HAL A. LINGERMAN

The research-based benefits of VAT are quite diverse. VAT is a mind-body medicine in the truest sense. Research-based benefits include:



Muscle Relaxation and Recovery

Through the percussive effects of the vibration on the body from the transducers in the sound bed, there is a massage-like effect. The result of this is an increase in local circulation, the release of tight connective tissue, and a reduction in muscle tension.



Cellular Balance (Homeostasis)

At the cellular level, for the human body to function in an optimal state, there must exist a highly effective communication system capable of evaluating and reacting to the moment-to-moment changes occurring internally and externally. Through the continuous conversion of the mechanical energy into bioelectric energy within the body, and the chemical responses which also occur, VAT can promote the restoration of a better-balanced state of key cellular activity. In particular research suggests that both the digestive and immune systems respond positively from VAT. This may also be beneficial for pain when combined with traditional therapies.





Reduced Effects of Stress & Improved Sense of Calmness

Considered to be the most immediately recognized benefit, a reduced state of anxiousness and an improved sense of calmness has been shown to occur with VAT. This may occur from entrainment or the effects of the balancing frequencies used, coupled with the vibration of the transducers acting on the tactile/touch system to promote muscle relaxation.



Boosted Energy, Mood, and Ability to Focus

It is possible to use VAT to elevate one's mood or support the brain in moving towards brain wave states associated with higher levels of activity or a heightened state of focus.



Sleep Support

Through the combination of soundtrack engineering intended to encourage delta brain waves associated with sleep and an improved overall state of calmness caused by VAT, improvements in the quality of sleep may be seen with VAT.



Vibroacoustic Therapy and States of Non-Ordinary Consciousness



"The desire for perfection is that desire which always makes every pleasure appear incomplete, for there is no joy or pleasure so great in this life that it can quench the thirst in our soul."

STANISLAV GROF

As we've stated all along, the end result of VAT is a change in the communication pathways within the brain. However, in each example above, the discussion centers around the using VAT to improve physical, emotional, or cognitive issues. For people who do not prioritize these issues, there is another use of VAT which certainly puts it at the forefront of the therapy continuum; promoting the movement of an individual into a non-ordinary state of consciousness, much like that realized in deep meditation or certain psychedelic experiences.

In the brain, meditation and psychedelics have been shown to create changes in various neurochemical pathways. Examples of these pathways include the serotonin and dopamine pathways. VAT may produce similar changes through the neurochemical response due to the increased neurological activity associated with select programming.

Now, if you grew up between the 1960's and 1990's, the idea of a non-ordinary state of consciousness may sound concerning. But as modern-day research around the mental health benefits of meditation and psychedelic-assisted therapy expands at a record pace, non-ordinary states of consciousness are considered by many to not represent a recreational, hallucinogenic "trip," but rather a scientifically supported means to leverage a temporarily state of enhanced brain connectivity. In this state, people can better solve complex problems, access enhanced creativity, or gain self-awareness and intuition.

To be clear, VAT does not operate at the extreme level as psychedelics does when it comes to non-ordinary states of consciousness. For this reason, it may represent a comfortable entry point for someone looking to explore non-ordinary states of consciousness for the above reasons. It can also be a great tool for a practitioner looking for additional resources to explore non-ordinary states of consciousness with their clients.



The non-ordinary states of consciousness-related benefits of VAT are as follows:



Body Dissociation

One of the most common experiences during a non-ordinary state of consciousness is the feeling of not being as connected to one's physical body. Often, this experience can be concerning for beginners and one of the reasons they resist the experience. However, for experienced individuals, this is a welcomed change in sense perception as it suggests the movement towards a state of oneness with the world around them. By carefully manipulating the vibration being delivered by the transducers in the bed, an individual can experience body dissociation as a result of the distortion in their tactile/touch sense perception.



Restoring Body Awareness

While improved body awareness is indeed a more traditional benefit of VAT, in a non-ordinary state of consciousness, being able to use the vibrating transducer system to help an individual feel or return to their body from a dissociated state is possible.



Entraining Gamma, Theta & Delta Brain Wave Patterns

As discussed previously, certain vibroacoustic soundtracks can be engineered to entrain the brain into gamma, theta and / or delta brain wave states. In recent research on the brain wave activity of subjects taking Ayahuasca, the active ingredient in which is the psychedelic substance dimethyltryptamine (DMT), a unique harmonized pattern of theta and delta brain waves were recorded. This is consistent with both the inward focus attributed to theta waves and the dream-like states associated with delta waves. Through thoughtfully engineered brain entrainment soundtracks one may experience a much lower intensity version of this type of non-ordinary state of consciousness.





Synesthesia

Synesthesia is a fascinating perceptual phenomenon whereby two traditionally distinct sense perceptions become entangled. An example of synesthesia is seeing music or hearing colors. While most falsely perceive this as an undesirable neurological condition, synesthetes have been shown in research studies to have higher levels of intelligence and enhanced levels of creativity. Because of the fact that VAT involves both auditory and tactile/touch systems to be simultaneously stimulated by the same sound waves, there is likely a cross-communication phenomenon in the brain which may promote a temporary state of synesthesia.

I would imagine that the above information is not what most expect to be seen as a benefit of VAT. However, having worked with clients who are solely interested in experiencing the benefits associated with a non-ordinary state of consciousness, there is little doubt that this is something few other therapies can promote in the absence of psychedelic compounds.



CHAPTER 5

The Future of Vibroacoustic Therapy

“We should be in constant evolution and adapt to the new without ever losing our essence or our integrity.”

PEDRO CAPO

With Vibroacoustic Therapy there is an opportunity to integrate ancient knowledge, modern technology, and energetic principles of the human body to provide a safe, drugless, beneficial, and most importantly, enjoyable experience. As we move forward, the increased demand for more comprehensive, preventive solutions to chronic mental and physical health issues is an inevitability. We no longer have to look far to find a close friend, family member, or member of our community struggling to live life as they've been told it is meant to be lived; being imbalanced is the norm and this is not sustainable.

With new information being made available by advanced brain imaging techniques, energy medicine tools like Vibroacoustic Therapy are experiencing a renaissance. Now possessing a scientifically supported backbone, we may just have the right opportunity to encourage people to experience the effects themselves. This is where the wonderful experience of a properly constructed, individualized Vibroacoustic Therapy program can be transformative for both the individual and the professionals who care for them.

