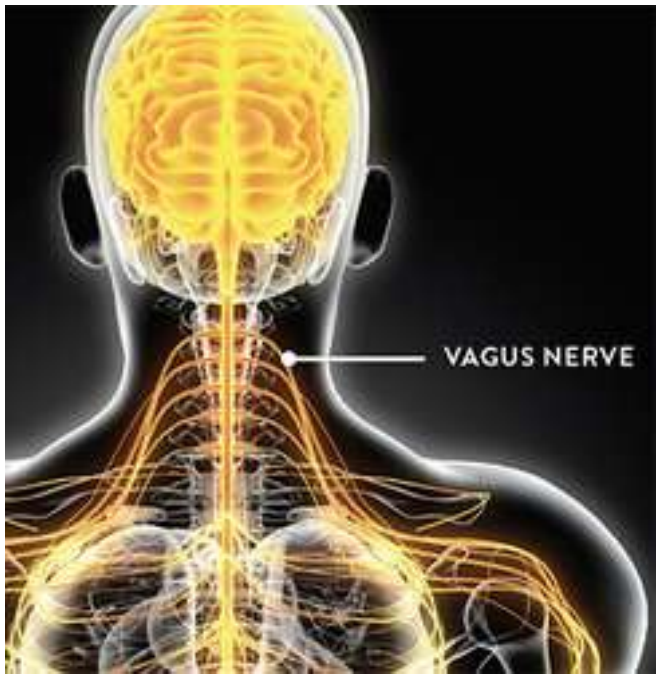
Cryotherapy for Vagus Nerve Stimulation, and How it Can Help with Various Conditions

Research and Reported Benefits

What is Vagus Nerve, and Why Is It Important

The **vagus nerve** is the longest and most complex of the 12 pairs of cranial nerves that emanate from the brain. It transmits information to and from the surface of the brain to tissues and organs in many parts of the body. Essentially, it is part of a circuit that links the neck, heart, lungs, and the abdomen to the brain.

The name "vagus" comes from the Latin term for "wandering", due to its broad impact.



The nervous system can be divided into two areas: sympathetic and parasympathetic.

The sympathetic side INCREASES alertness, energy, blood pressure, heart rate, and breathing rate.

The parasympathetic side or the "rest and digest" nervous system in which the vagus nerve is heavily involved DECREASES alertness, blood pressure, and heart rate, and helps with calmness, relaxation, digestion, bladder, bowel, and sexual functions.

It not only influences our breathing and heart rate, but also has a **scientifically proven ability to control inflammation within the body**, thus having a huge impact on our physical and mental health.

Important vagus nerve **effects include**:

- **Communication between the brain and the gut.** The vagus nerve transfers information from the gut to the brain and is involved with delivering the signal of satiety (for this reason, proper vagus nerve function is essential in fighting weight gain)
- **Decreasing inflammation**. The vagus nerve sends anti-inflammatory signals to other parts of the body
- **Fear management**: The vagus nerve sends information from the gut to the brain, which is linked to dealing with stress, anxiety, and fear (this is where the term "gut feeling" comes from). These signals help us recover from stressful and scary situations
- **Lowering the heart rate and blood pressure.** If the vagus nerve is overactive, it can lead to the heart being unable to pump enough blood around the body. In some cases, excessive vagus nerve activity can cause loss of consciousness and organ damage
- **Relaxation**, as the vagus nerve communicates with the diaphragm. With deep breaths, we feel more relaxed

All the above stresses the importance of a healthy vagus nerve function.

Poor vagal tone is associated with spending too much time in the sympathetic (fight/flight/freeze) side of the nervous system and, in a long term, can lead to chronic autoimmune disease, pulmonary disease and neurological disorders.

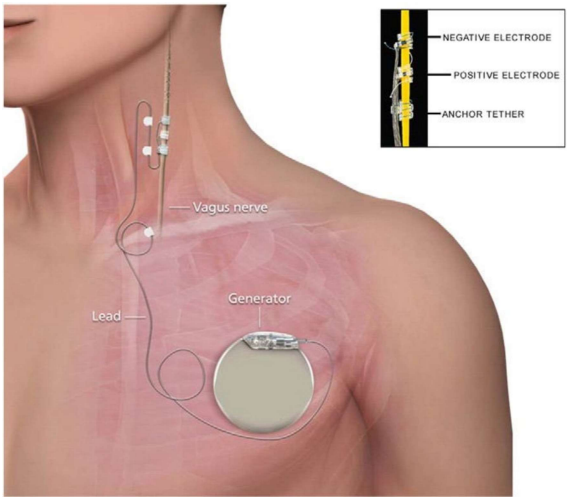
Stimulation of the vagus nerve can result in numerous benefits for the most vital functions of the body. The short-term benefits include wakefulness, consciousness, sharper memory, lower blood pressure, reduction of stress, anxiety, and brain fog.

Stimulation of Vagus Nerve as a Medical Procedure

Vagus nerve can be stimulated through electrical pulses delivered through an implantation. It ensures that controlled electrical shocks are sent to the nerve.

The approach has been tested through clinical trials. Consequently, the United States Food and Drug Administration (FDA) has **approved its use to treat two different conditions: epilepsy and mental illness (depression)**.

This is how a vagus nerve stimulating implant works:



With the vagus nerve having pathways to almost every organ in the body, **researchers are looking to see if stimulation can help other conditions, including rheumatoid arthritis**.

A 2016 study showed that vagus nerve stimulation COULD help reduce rheumatoid arthritis symptoms. Individuals who had failed to respond to other treatment reported significant improvements, while no serious adverse side effects were noted. This was considered a real breakthrough in how vagus nerve stimulation might not only treat rheumatoid arthritis but also other inflammatory diseases, including Parkinson's and Alzheimer's.

Getting an implant is a medical procedure that involves a minor surgery.

Cryo Stimulation of the Vagus Nerve for Pain Management and General Health and Well-Being

There are many other (non-medical) means to stimulate the vagus nerve.

Cold exposure is one of the most effective ones, because the body's natural response in the cold is to use the breath to calm down. We go from our sympathetic to parasympathetic nervous system once passing a certain time frame (45-75 seconds for the average person).

Biohacking has become a popular topic in the 21st century. It means taking control of our biology through better understanding of the body and mind we have been given and then using science, various tools and technology in order to become the best version of ourselves. **Cold thermogenesis** is one of the biohacking methods promoted by well-known authors such as Dr. Jack Kruse, Dave Asprey and "the Iceman" Wim Hof, to name just a few.

According to a 2001 study, **acute cold exposure activates the vagus nerve** and cholinergic neurons and nitrergic neurons through its pathways. When the body adjusts to cold, sympathetic activity of the nervous system decreases while the parasympathetic system gets activated. Among other things, it makes us feel recharged and energized.

The **Wim Hof Method** is increasingly popular, but extreme. It is based on 3 pillars: cold training (in an ice bath), breathing, and commitment, and usually starts with a "cold shower" challenge. Mastering it takes gradual approach, time and dedication.

Whole body cryotherapy is a much faster and painless alternative that also stimulates the vagus nerve - through exposure to extremely low temperatures. It delivers proven by numerous studies health benefits that include but are not limited to inflammation and pain reduction in short and dry 3-minute-max sessions that do not require any preparation.

In between cryotherapy treatments, drinking ice-cold water, face dunking in it, as well as deep breathing and simple exercises can improve vagal tone and help to reap maximum benefits.

The Ways to Stimulate the Vagus Nerve at Home

In addition to medical or cryo-stimulation of the vagus nerve, numerous other beneficial practices can be adopted, like:

Deep diaphragmatic breathing with an emphasis on the exhale can reduce anxiety and stress, increasing heart rate during the inhale and decreasing it with the out breath. This is the simplest means of vagus nerve stimulation that requires very little time and can be performed even during a lunch break at work.

Meditation or yoga poses which incorporate deep breathing.

Tai Chi.

Any exercise. The positive effects include healthier brain and cognitive function support, in line with better gut flow which is mediated by the vagus nerve.

Massage. Vagus nerve can be stimulated by massaging feet and neck along the carotid sinus, located along the carotid arteries on either side of the neck, or by a pressure massage. A neck massage can also help reduce seizures, while a foot massage is good for lowering heart rate and blood pressure.

Gargling with water. It may sound surprising but gargling actually stimulates the muscles of the pallet which are fired by the vagus nerve.

Positive Social Relationships. A study had participants think compassionately about others while silently repeating positive phrases about friends and family. Compared to the control group, the results showed an overall increase in positive emotions like serenity, joy, and hope. These positive thoughts of others led to an improvement in vagal function as seen in heart-rate variability and also resulted in a more toned vagus nerve than when simply meditating.

Other mentioned in literature factors positively influencing the vagus nerve function include laughter, singing, chanting, and any kind of relaxing activities.

Sources:

Autonomic nervous function during whole-body cold exposure before and after cold acclimation
Aviation, space, and environmental medicine, Sep 2008
https://www.ncbi.nlm.nih.gov/pubmed/18785356

Vagus nerve stimulation inhibits cytokine production and attenuates disease severity in rheumatoid arthritis
PNAS (Proceedings of the National Academy of Sciences of the United States of America), Jul 2016
https://doi.org/10.1073/pnas.1605635113

Vagus Nerve Stimulation Quickly and Consistently Reduces Pain Intensity, Rescue Medication Use in Migraine
AJMC, Nov 2018
https://www.ajmc.com/newsroom/vagus-nerve-stimulation-quickly-and-consistently-reduces-pain-intensity-rescue-medication-use-in-migraine

www.medicalnewstoday.com

www.wimhofmethod.com

www.americanheadachesociety.org