All About Your VAGUS Nerve!

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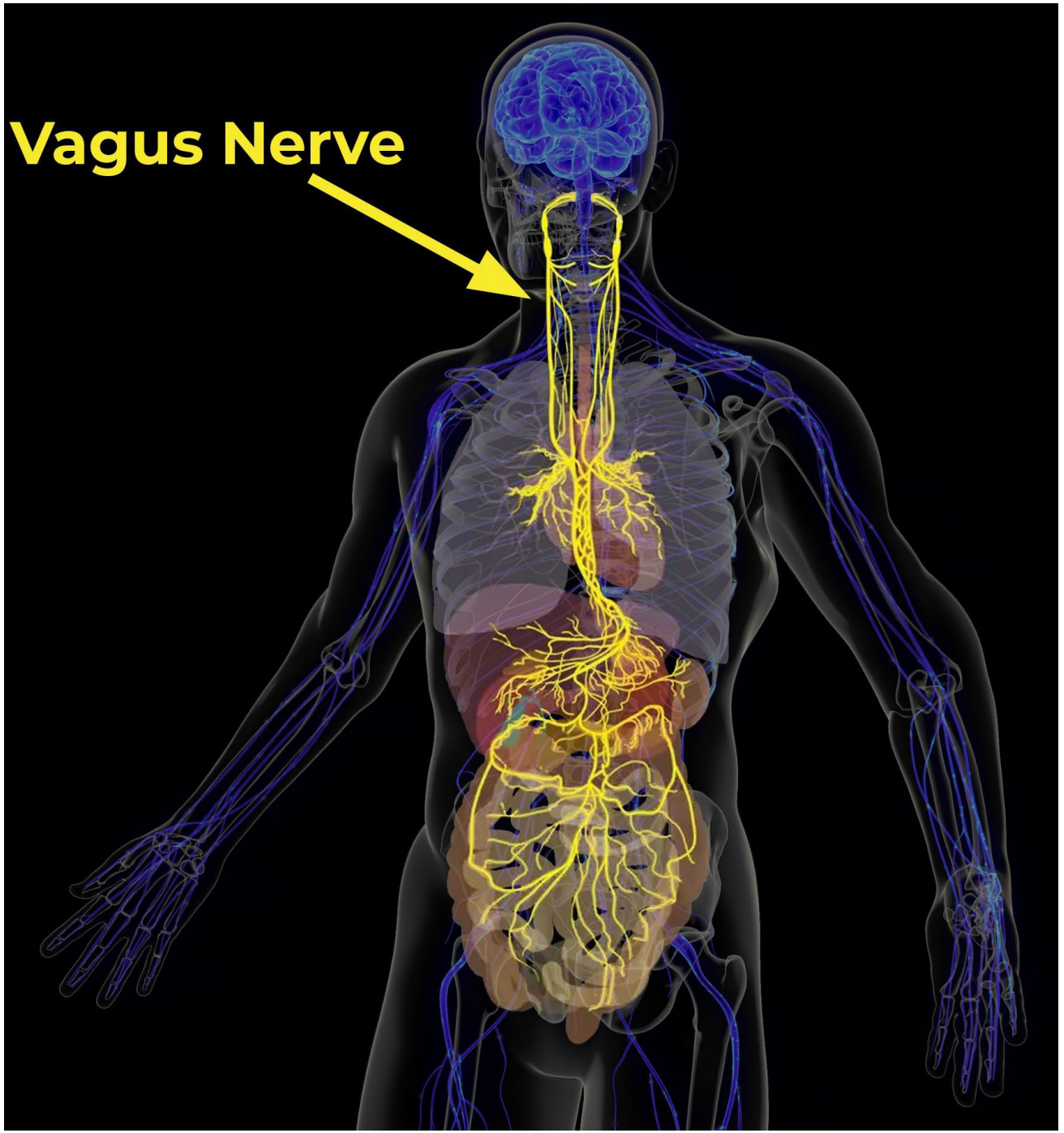

Brain connects to:

1. Ears and eyes
2. Tongue
3. Esophagus
4. Stomach
5. Pancreas
6. Intestines
7. Liver
8. Kidney
9. Colon
10. **Lungs and Heart**

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Introduction & The Vagus Nerve Basics

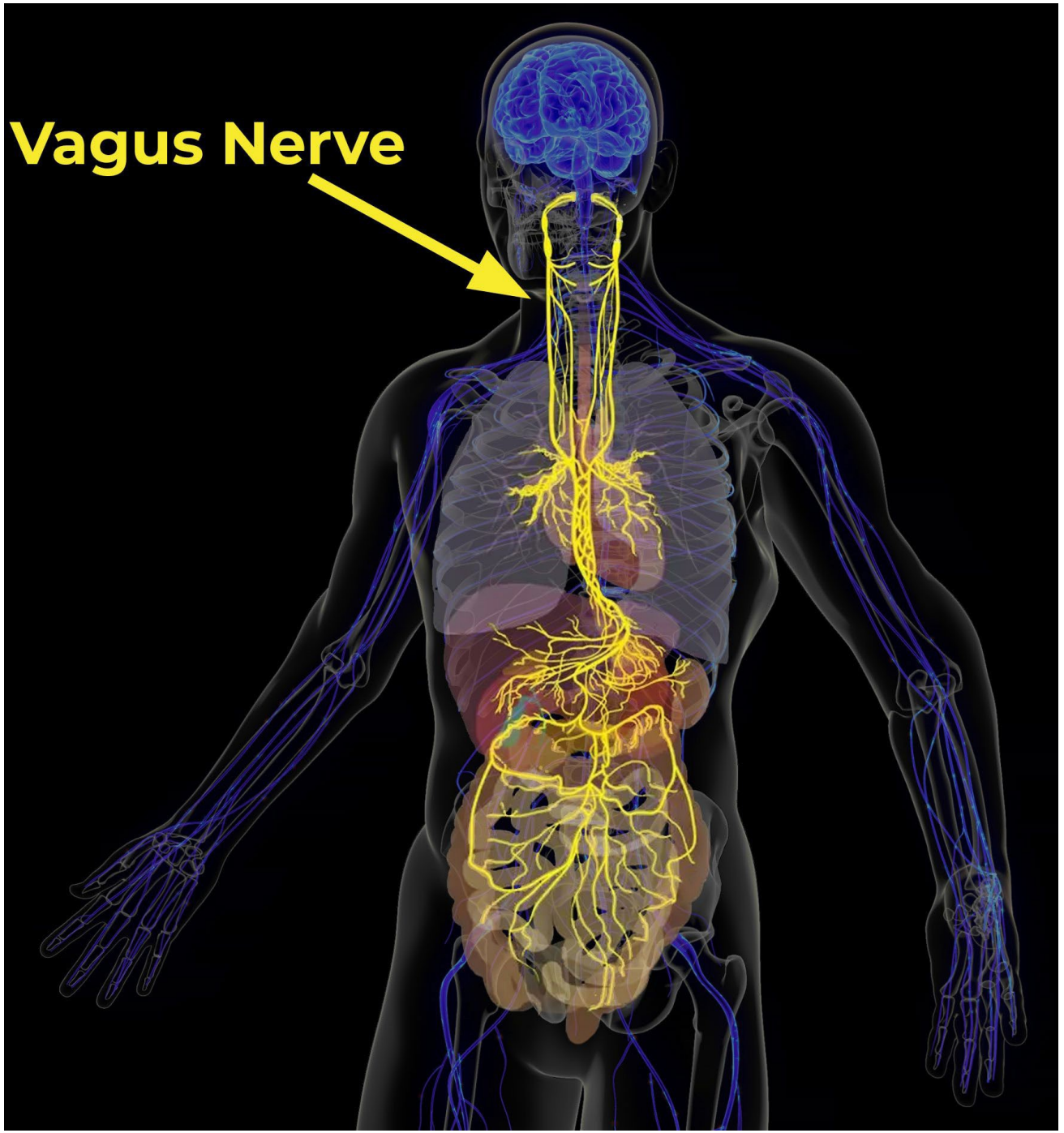
The vagus nerve (10th cranial nerve) is the longest and most complex cranial nerve. It controls autonomic (involuntary) functions:

- Rest and relaxation
- Restore and repair anti-inflammatory
- Digest
- Reproduce

Begins in the midbrain, branching to throat, voice box, ear, heart, lungs, diaphragm, esophagus, and digestive organs.

Functions as a bi-directional information highway—collecting body information and sending and instructing the biochemistry of the body in every moment; metaphorically described as the "software" controlling the body's "hardware."

- Homeostasis depends on the vagus nerve
- Controls the inflammatory response
- Hormesis is followed by vagal activity
- Resilience depends on your vagal tone



This is the software that is running your hardware of the body

Real-time micro adjustment to your biology

Vagus nerve has two-way traffic, to and from the organ

You can voluntarily HACK your vagus nerve

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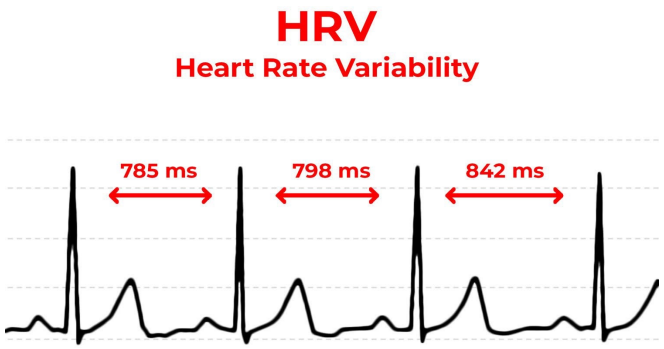
Dysautonomia

1. Causes Postural Orthostatic Tachycardia Syndrome (POTTS), a disorder where a rapid increase in heart rate occurs upon standing, leading to symptoms like dizziness, light-headedness, fainting, and brain fog
2. Inappropriate sinus tachycardia – heart beats more than 100 times per minute, but returns to normal after the stressful event has passed
3. Vasovagal syncope or presyncope – a brief loss of consciousness before which may be sweating, decreased ability to see, ringing in the ears
4. PVCs and PACs – both cause symptoms like palpitations or fluttering feeling
5. Atrial fibrillation – an abnormal heart rhythm characterized by rapid and irregular beating of the atrial chambers of the heart
6. Orthostatic hypotension – a medical condition wherein a person's blood pressure drops when they are standing up or sitting down
7. Constipation or diarrhea
8. SIBO – Small intestinal bacterial overgrowth, leading to digestive symptoms like bloating, pain, and diarrhoea, as well as malabsorption of nutrients
9. Gallbladder dysfunction – gallbladder cannot effectively store or release bile into the small intestine for digestion, leading to symptoms loke upper abdominal pain

Breathing Exercise to Hack the Vagus Nerve

Heart rate variability (HRV): Vagally mediated, healthy HRV means fluctuating heart rate with each breath.



Key technique: Slow exhalation stimulates the vagus nerve and parasympathetic system—recommend inhale for 4–5 seconds, exhale for 10 seconds.

Abdominal breathing (not chest breathing): Belly expands on inhale, contracts on exhale.

In stressful situations, extended exhalation “confuses the brain” by mimicking a relaxed (parasympathetic) state, thus switching off the stress (sympathetic) response.

Application: Use this technique during stress to shift body chemistry toward relaxation.

Long-Term Effect of Device-Guided Slow Breathing on Blood Pressure Regulation and Chronic Inflammation in Patients with Essential Hypertension Using a Wearable ECG Device

Chen-Hsu Wang [1 2], Hui-Wen Yang [3], Han-Luen Huang [1 4], Cheng-Yi Hsiao [1], Bun-Kai Jiu [1], Chen Lin [1 5], Men-Tzung Lo [1 5]

Affiliations + expand

PMID: 33716462 PMCID: PMC7953112 DOI: 10.6515/ACS.202103_37(2).20200907A

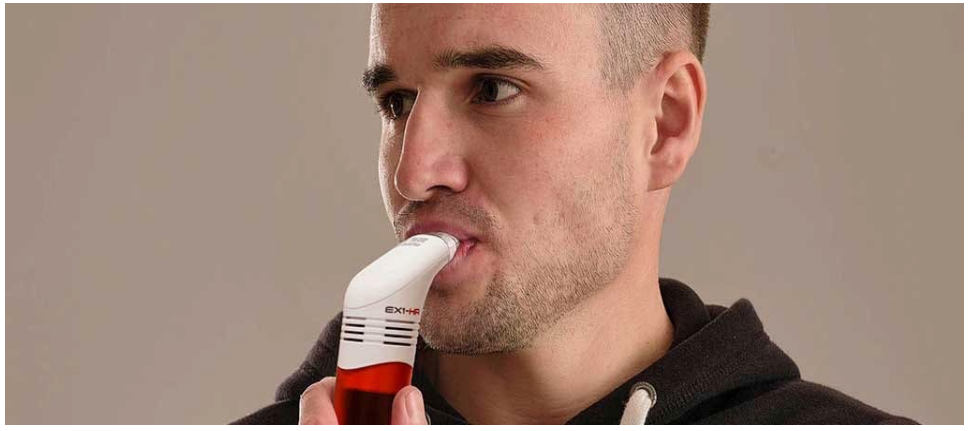
Abstract

Background: Hypertension is related to autonomic nervous system (ANS) dysfunction, atherosclerosis and chronic inflammation. The stimulation of baroreflex regulation by slow-breathing exercise may improve the interplay among these systems. The objective of this study was to investigate the effect of device-guided slow breathing on ANS, cardiovascular system and chronic inflammation in hypertensive patients.

Methods: We prospectively collected 36 essential hypertension patients who were requested to practice slow-breathing exercise 5 times per day for 3 months. The breathing exercise was guided by a cellphone app with a wearable electrocardiography device and a rhythm of 6 cycles per minute. Cardiovascular indicators including heart rate variability (HRV), blood pressure, pulse wave velocity and baroreflex indexes were sampled 3 times: at the first visit, and 1 month and 3 months after the intervention. The levels of blood inflammatory biomarkers, including tumor necrosis factor-alpha (TNF-α), interleukin-6, interleukin-1 receptor antagonist and C-reactive protein were also collected at all 3 visits. The longitudinal differences in these variables and their correlations were tested.

Results: There was a significant decrease in blood pressure after 1 month of exercise. A significantly continuous decrease in TNF-α was also observed. The baroreflex indexes were significantly increased in the acute intervention of slow-breathing but not in the longitudinal effect. The HRV variables did not show differences with time. There were positive correlations between sympathetic index and TNF-α and galectin-3.

Conclusions: The effect of slow-breathing exercise on blood pressure and chronic inflammation was significant. HRV indexes may also be used to assess chronic inflammation.



Device-guided slow breathing: Shown to lower blood pressure and inflammation by boosting vagal tone

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Device and non-device-guided slow breathing to reduce blood pressure: A systematic review and meta-analysis

Ashish Chaddha [1], Daniel Modaff [2], Christopher Hooper-Lane [3], David A Feldstein [2]

Affiliations + expand

PMID: 31331557 DOI: 10.1016/j.ctim.2019.03.005

Abstract

Objectives: Interest is increasing in nonpharmacological interventions to treat blood pressure in hypertensive and prehypertensive patients at low cardiac risk. This meta-analysis of randomized controlled trials assesses the impact of device-guided and non-device-guided (pranayama) slow breathing on blood pressure reduction in these patient populations.

Methods: We searched PubMed, EMBASE, CINAHL, Cochrane CENTRAL, Cochrane Database of Systematic Reviews, Web of Science, BIOSIS (Biological Abstracts) Citation Index and Alt HealthWatch for studies meeting these inclusion criteria: randomized controlled trial or first phase of a randomized cross-over study; subjects with hypertension, prehypertension or on antihypertensive medication; intervention consisting of slow breathing at ≤10 breaths/minute for ≥5 min on ≥3 days/week; total intervention duration of ≥4 weeks; follow-up for ≥4 weeks; and a control group. Data were extracted by two authors independently, the Cochrane Risk of Bias Tool assessed bias risk, and data were pooled using the DerSimonian and Laird random effects model. Main outcomes included changes in systolic (SBP) and/or diastolic blood pressure (DBP), heart rate (HR), and/or decreased antihypertensive medication.

Results: Of 103 citations eligible for full-text review, 17 studies were included in the meta-analysis. Overall, slow breathing decreased SBP by -5.62 mmHg [-7.86, -3.38] and DBP by -2.97 mmHg [-4.28, -1.66]. Heterogeneity was high for all analyses.

Conclusions: Slow breathing showed a modest reduction in blood pressure. It may be a reasonable first treatment for low-risk hypertensive and prehypertensive patients who are reluctant to start medication.

Respirate device: Teaches slow, prolonged expiration; FDA-approved for hypertension

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Low-Level Vagus Nerve Stimulation Suppresses Post-Operative Atrial Fibrillation and Inflammation: A Randomized Study

Stavros Stavrakis [1], Mary Beth Humphrey [1], Benjamin Scherlag [1], Omer Iftikhar [1], Purvi Parwani [1], Mubasher Abbas [1], Adrian Filiberti [1], Christian Fleming [1], Yanqing Hu [1], Paul Garabelli [1], Arthur McUnu [1], Marvin Peyton [1], Sunny S Po [2]

Affiliations + expand

PMID: 29759717 DOI: 10.1016/j.jacep.2017.02.019

Free article

Abstract

Objectives: This study sought to examine the efficacy of low-level vagus nerve stimulation (LLVNS) in suppressing post-operative atrial fibrillation (POAF) and inflammatory cytokines in patients undergoing cardiac surgery.

Background: POAF often complicates cardiac surgery.

Methods: Patients undergoing cardiac surgery were randomized to active or sham LLVNS. In all patients, a bipolar wire was sutured to the vagus nerve pre-ganglionic fibers alongside the lateral aspect of the superior vena cava. High-frequency (20 Hz) stimulation, 50% below the threshold for slowing the heart rate, was delivered for 72 h in the LLVNS group. The development of POAF was monitored continuously during the entire hospital stay by use of telemetry. Blood was collected on arrival in the intensive care unit and at 24 and 72 h for measurement of inflammatory cytokines. Patients were followed up within 1 month after cardiac surgery.

Results: A total of 54 patients were randomized to either active LLVNS (n = 26) or sham control (n = 28). The baseline characteristics of the patients were balanced in the 2 groups. POAF occurred in 3 patients (12%) in the LLVNS group and 10 patients (36%) in the control group (hazard ratio: 0.28; 95% confidence interval: 0.10 to 0.85; p = 0.027). None of the patients developed any complications as a result of wire placement. At 72 h, serum tumor necrosis factor-α and interleukin-6 levels were significantly lower in the LLVNS group than in the control group.

Conclusions: These data suggest that LLVNS suppresses POAF and attenuates inflammation in patients undergoing cardiac surgery. Further studies are warranted.

Low-level vagal nerve stimulation (LLVNS): In cardiac surgery patients, reduced postoperative atrial fibrillation and inflammation

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Exercise and the Vagus Nerve

- Intermittent intense exercise followed by complete rest can swiftly shift from sympathetic (fight or flight) to parasympathetic (rest and repair) dominance.
- Advocated method: Short bursts of high-intensity exercise, then immediate deep rest, to rapidly enhance vagal tone and aid recovery.

The Sympathetic & Parasympathetic Nervous Systems

- The sympathetic system manages acute stress ("fight or flight").
- The parasympathetic system (vagus nerve dominated) is responsible for "rest and digest/repair."
- Cannot simultaneously be in both states, so frequent parasympathetic activation is essential for healing, digestion, and overall resilience.
- Good vagal tone (the ability to switch to parasympathetic) improves resilience and stress tolerance.

Exercises to improve vagal tone

- Lateral gaze eye movements
- Gentle eyeball massage
- Cold water to the eyeballs
- Ice water to the face
- Ice pack to the neck
- Valsalva maneuver
- Balloon blowing
- Prolonging expiration stimulates vagus nerve
- Yoga postures
- Meditation
- Humming
- Gargling
- Cold shower/ immersion/ infrared sauna
- High-intensity Interval Training (HIIT)

Techniques to Hack the Vagus Nerve

Breathing: Prolonged, slow expiration is the primary method.

Massaging the eyes: Gentle eye pressure can lower heart rate via vagal stimulation.

Eye movement: Slow, deliberate left-right eye movements or holding gaze.

Cold exposure: Ice packs or cold showers around the neck stimulate the vagus.

Humming, laughter, singing, gargling: Vibrations in the throat activate vagus pathways.

Balloon blowing: Increases intrathoracic pressure, activating vagal reflex.

Valsalva maneuver: Breath in, then forceful exhalation against a closed airway stimulates vagus to stop a supraventricular tachycardia (SVT).

- Take a breath
- Close airway, pinch nose shut and close month
- Bear down, forcefully exhale as if trying to blow up a balloon
- Hold for 10 to 15 seconds
- Release, open month and nose and breathe out

Ear massage: Massaging the tragus (outer ear) area.

Commercial devices and stimulators: FDA-approved for migraines and seizures, yet self-hacks (cold, music, breathing) are free alternatives.

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The Vagus Nerve and the Gut

- Huge vagal presence in the gut; coordinates gut-brain communication.
- Dysfunctions (leaky gut, wrong gut bacteria, food sensitivities) can impair vagal function, cause inflammation, and influence brain and heart health.
- Chronic inflammation often originates in the gut—addressing vagal tone can reduce systemic inflammation.
- Gut-brain axis: Pathway for gut-derived toxins or signals to reach the brain via the vagus, implicated in diseases like Parkinson's.

Fixing Vagus Nerve for Autonomic & Gut Problems

- Symptoms like constipation, diarrhoea, gut functional disorders often relate to vagal or enteric nervous system problems.
- Fixing gut health (diet, probiotics, essential fats) and practicing vagal stimulation can normalize gut and heart function.
- Example: Herbal protocols for Small Intestinal Bacterial Overgrowth (SIBO) improved both gut symptoms and heart rate issues.

Omega-3 & Vagal Health

- Omega-3 fatty acids are crucial for healthy vagal (and general neural) function.
- Modern diets are often skewed towards omega-6, to the detriment of vagal tone.
- Supplementation with high-quality, toxin-free omega-3s is recommended, especially for vegans.

Enteric Nervous System of the GUT

ENS is the “brain in your gut,” a vast network of over 100 million neurons within the gastrointestinal tract that controls digestive functions independently of the brain. While it can operate autonomously, the ENS also communicates with the central nervous system (CNS) to influence emotional shifts and overall gut health.

1. Becomes dysfunctional if there is inflammation in the GUT
2. Becomes dysfunctional if there is dysbiosis
3. Becomes dysfunctional if there are food sensitivities
4. Becomes dysfunctional with SIBO
5. Becomes dysfunctional after antibiotics
6. Becomes dysfunctional with drugs that slow GUT motility
7. Becomes dysfunctional after surgery
8. Becomes dysfunctional with stress (efferent fibers – from CNS to periphery)
9. Causes CNS inflammation (afferent fibers – from periphery to CNS)
10. Can cause mental fog, depression, and anxiety

Sleep, Stress, and Vagal Dysfunction

Sleep apnoea: Vagus nerve dysfunction may worsen sleep quality; strategies to support vagus nerve (diet, weight loss, stress reduction) can help.

- Serotonin and melatonin: Both impact vagal tone and sleep quality. Tryptophan supplementation may promote deeper sleep.

Fainting, Heart Palpitations, and Blood Pressure

- Overactive or underactive vagus nerve affects heart rhythm and syncope.
- Balancing sympathetic/parasympathetic activity is crucial for stable heart and blood pressure regulation.

Psychosocial Influences

- Social connection, life meaning, forgiveness, feeling safe, and physical touch all enhance vagal tone.
- Life philosophy and mindset (living in the present, not holding grudges, having control) profoundly influence vagus nerve health.

Fasting, Menstruation, and Gender Differences

- Women: Preferable to fast after menstruation, not before or during.
- Fasting and perimenopause: Enhances brain plasticity and can aid symptom management via increased vagal activity.

Final Takeaways

Vagus nerve health is fundamental for resilience, inflammation control, gut and heart health, emotional well-being, and longevity.

Most hacking techniques are free, practical, and can be started immediately, including breathing methods, laughter, cold exposure, diet, and psychosocial practices.

Vagus Nerve Hacks: Powerful Techniques to Enhance Health and Well-Being