PETER KAN, DC, DACNB, FAAIM, CFMP

Vagus Nerve STIMULATION

Boost Immunity, Heal Your Gut, and Elevate Mood & Brain Health

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INTRODUCTION

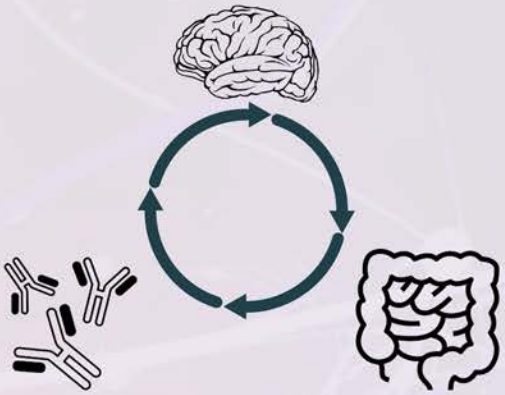
I'm sure you've heard the chatter.

The endless conversation around the Vagus Nerve and its importance - a topic that I know will have a huge impact on the lives of so many people!

It's a conversation we should have been having for years, but most people don't even know what their Vagus Nerve is, let alone why it's **critical** to support its stimulation.

There's a bigger picture that comes along with knowing about your vagus nerve- a BIG connection if you will...

The **B**rain - **I**mmune - **G**ut connection...



I'm sure you've come across dozens of people on the internet talking about vagus stimulation and practices that "work" to increase vagal tone. Anecdotal kinds of things like a little massage here, or pull your ear lobes and wiggle your nose to stimulate the vagus nerve....

But what about the things that are backed by **science**?

Note: This is not to say that anecdotal practices of wiggling your nose or pulling the ears don't work! This may work for *some* people. Just perhaps not the majority of people. This eGuide is about spreading information on the vagus nerve, and then giving you some of the science-backed practices for stimulating it that are shown to consistently work for most people.

THE BRAIN-IMMUNE-GUT AXIS

What is the brain-immune-gut axis?

As you can probably guess, it is the connection between the brain, the immune system, and the gut, but that is a very basic definition of a vastly complex and beautifully synchronistic relationship within your body.

These all work in sync to create harmony, balance, and regulation in the body. A symphony of healing, if you will.

However, though they may all **work** together, they also **dysfunction** together.

When everything is is in balance, you feel good. But when something goes wrong, it becomes like a domino effect - all three systems fall apart - and this creates vicious cycles; chronic symptoms that seem very hard to resolve.

If you have chronic brain, immune, or gut symptoms, then you are precisely who this has been written for, because your vagus nerve is at the center of this **BIG** connection!

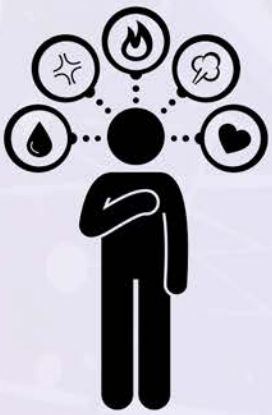
To be clear, this is no magic pill. I'm not saying this is a quick fix. But you can get better, because there are tools you likely are not using at all, or at the highest level possible.

First and foremost, you have to address the root cause of illness, and that means you have to ask the ultimate question:

What is driving your dysfunction?

The more you understand what's driving the problem, the better you can choose which tool to use.

Note: There are many chronically ill people tangled up in a web of dysfunction, surrounding the brain-immune-gut, and many of them tend to be very sensitive to foods, chemicals and even some supplements.



So you may want to take supplements, and you've read all of the benefits and incredible things online or from the pharmacist, but it is possible that you just simply can't take them without an adverse reaction...

Or you would love to eat all of the wonderful, healthy foods out there, but when you eat them, you end up feeling unwell or lethargic....

These are brain-immune-gut reactions.
And they're **very common.**

...So what can you do? Where do you turn
when you're sensitive to certain foods or supplements?

You obviously need food to live. You may even need certain supplements to function properly.

And if you can't tolerate them due to adverse reactions from the BIG axis, you need to find a way to help your body **learn** to tolerate them.

Well, that's where vagus nerve stimulation comes into play.

It can be the avenue to bypass oral intolerance issues to directly restore brain and immune-gut function by impacting the system!

Now, this is not to say that it's going to happen overnight. But you will begin to turn the tide, so you can start to turn the ship around.

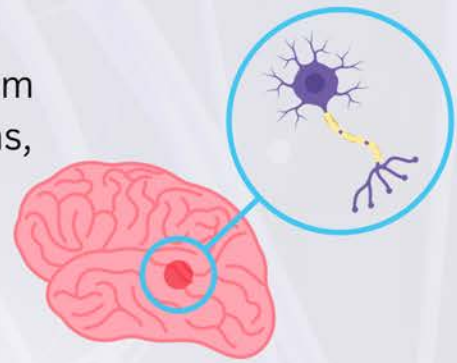
When you make even just a little progress, more progress can be achieved!

THE BASICS

I want to do some Vagus 101. Most people don't even know the most rudimentary information, and that's keeping you from utilizing your vagus nerve to its full effect!

Here are the basics: Your Vagus nerve is one of the 12 pairs of cranial nerves. More specifically, it is cranial nerve number 10.

Cranial nerve 10, or the vagus nerve, is a long, wandering nerve that originates in your brain stem and travels through most of your digestive organs, including your:



- Swallowing muscles
- Stomach
- Pancreas
- Small intestine
- Large intestine
- All glands that secrete digestive juices

You may be wondering, *"What are cranial nerves exactly?"* If you were to look at the skull from the bottom looking up, you would see little holes where the cranial nerves essentially come out of the brain stem.

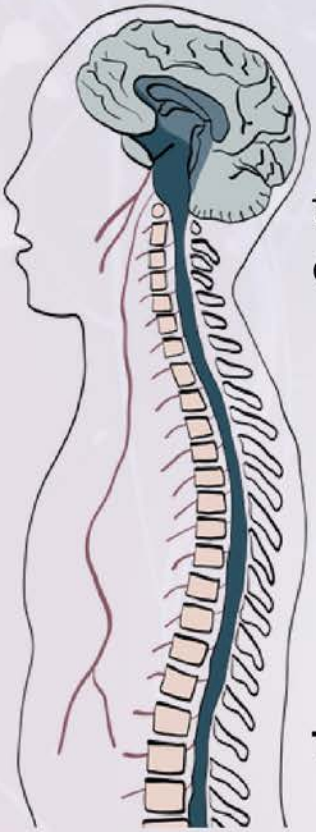
But what do they do? Well, for most of them, they work with parts of your facial structure.

Olfactory Nerve - Controls your sense of smell.
Optic Nerve - Controls the retina, eye muscle movement
Trigeminal Nerve - Controls facial sensation
Facial Nerve - Controls facial muscles

Many of these cranial nerves control functions in your head, face, and neck. Some control muscle movement, others control sensations, some control specific sensations such as taste, and others control your autonomic nervous system.

There is one exception though, and that is the vagus nerve.

THE BASICS



The vagus nerve is special because it wanders all the way down through your GI tract. (It is the **ONLY** one that goes all the way down through the rest of your body. The remainder of your cranial nerves stay in the head.)

Why is that important? Well, the vagus nerve is part of your **autonomic nervous system (ANS),** the part of your nervous system that controls everything that is, basically, on autopilot - such as breathing, cardiac function and digestion.

The ANS has two branches.

The Sympathetic Nervous System - Your fight or flight response. Speeding things up so that you can get into action. Fighting a tiger or running away from the tiger, for example.

The Parasympathetic nervous system - This controls rest and digest. Think of it as your brake pedal. After you fight that tiger you have to take a break, right?

This is what makes everything in your body balanced.

Much like a car, you have your gas pedal and your brake pedal. The parasympathetic and sympathetic nervous systems operate exactly the same way.

THE BASICS

If you only have parasympathetic without sympathetic you'll go nowhere.

And in the parasympathetic nervous system, you have many cranial nerves involved. The vagus nerve is one of them, but it's **not** the only one.

A lot of people refer to the vagus nerve as the ONLY parasympathetic nerve, but that's simply not the case.

There are multiple nerves that control parasympathetic function, even non-cranial nerves like pelvic splanchnic nerves that come from your sacrum in the tailbone and control your bladder and sexual organs...

But the vagus nerve is the biggest one and controls most of the functions.

In fact, 90% of your parasympathetic function is controlled by the **vagus nerve**.

90%

What does the parasympathetic control? Well the largest part of your parasympathetic function is going to your heart, lungs, digestive organs, and immune function....

So, needless to say, the vagus nerve controls quite a lot.

Yes, it is mainly associated with digestion, but that's just not the only thing that it does. Don't forget it's **B-I-G.** The **Gut** is just one part of the trifecta!

NEUROFLEXES AND INFLAMMATION

I'm sure you're familiar with what a reflex is....

For instance, when you go to the doctor and they use a reflex hammer to tap your knee, and your knee kicks.

That's a reflex, right? Well, there's something called a **neural reflex** in inflammation and immunity. This means the brain and the immune system are **hard wired** to control inflammation and immunity.

Advancements in neurophysiological and immunological research techniques recently enabled the study of the neural reflex circuit that maintains immunological homeostasis that is <u>essential</u> for health.

What I mean is there is a neurological and immunological reflex circuit that maintains immune system balance and is essential for health. Failure of these reflex mechanisms contributes to non-resolving inflammation and disease.

Say you're inflamed, you're taking turmeric (which is anti-inflammatory), you're eating anti-inflammatory foods, you're doing everything you can to decrease inflammation, yet you're still inflamed.

That's called non-resolving inflammation. The same goes for things like arthritis, for instance, when it doesn't clear up and you experience pain. There's a neural reflex involved.

It's possible to target these neural pathways using vagus nerve exercises, electrical stimulation, and pharmacological agents - they can hasten the resolution of your inflammation and provide therapeutic benefits.

NEUROFLEXES AND INFLAMMATION

Your vagus nerve also connects to your spleen, and in your spleen, you have macrophages (immune cells that help destroy the bad invaders in your system). These macrophages have the ability to produce **cytokines**.

The more cytokine you produce, the more inflammation you produce. This is essentially the inflammation producing pathway

Spleen

Macrophage

So why would macrophage in the spleen produce these inflammation cytokines? Let me introduce DAMPs and PAMPs.

DAMPs - Damage Associated Molecular Patterns
PAMPs - Pathogen Associated Molecular Patterns

These are proteins from tissue, cell debris, or pathogens being destroyed by your immune system. Your macrophage is going to produce these cytokines as a "clean-up" response - which unfortunately can lead to inflammation if excessive.

As it turns out, the vagus nerve, through a very specific mechanism, can *dampen this inflammatory cytokine production cycle in the spleen.*

You may be wondering, *"Is that something that happens often? Should I be concerned about this?"*

Well, the short answer is **yes** - it's a huge deal. The cytokines produced by the macrophages in your spleen make up the bulk of inflammatory cytokines that are circulating in your body. So if you have non-resolving inflammation, the spleen is a large contributing producer of these inflammatory cytokines. And the vagus nerve can regulate that, so that it no longer overproduces cytokine, and therefore helps to **relieve the inflammation.**

So the bigger picture here is that if you're taking turmeric or other anti-inflammatory foods or supplements, but the inflammation still remains, it might be time to consider that the vagus nerve is not working to its full potential and is unable to do this particular part correctly at this moment.

NEUROFLEXES AND INFLAMMATION

Let's talk about antibodies! For starters, what are they?

Antibodies are your immune system's response to fighting intruders in the body. And when you have more antibody release you can potentially react to more things. More food sensitivities, more allergies, more autoimmune... Let's break this down a little further:

How do you test for food sensitivity?
You measure antibodies to various dietary proteins.

How do you test for chemical sensitivity?
You test for antibodies to various chemicals.

How do you test autoimmune?
You test antibodies to cell tissue.

So, if your immune system is overproducing antibodies, you can potentially react more aggressively to things in your environment!

Again, vagus nerve signaling has the potential to inhibit antibody production through neural-immune pathways, which can reduce your sensitivity to foods and chemicals.

Hopefully this is an AHA moment for you. That decreased vagus nerve function can lead to increased inflammation and sensitivities.

So many people think that supplements or diets are going to relieve the inflammation and sensitivity reactions, but that may not always be enough, especially if there is also a vagus nerve problem.

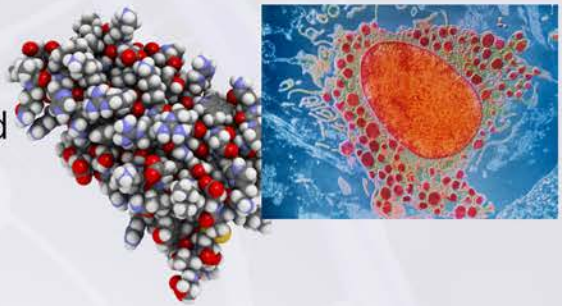
For some people, they have simply been trying to hit the wrong target for far too long.

Ok, so you already know that the vagus nerve can help to inhibit inflammatory cytokine release from the spleen - but did you know that it can do the same in the liver? Yes, vagus nerve activation can help with that pathway as well.

NEUROFLEXES AND INFLAMMATION

Here's a good example of the vagus impact on the liver.

Insulin resistance is a condition of overproduction of insulin due to the consumption of too many carbs and sugars, lack of exercise, stress, and inflammation.



Insulin resistance leads to the increased production of of interleukin 6, which is an inflammatory cytokine.

So while, blood sugar dysfunction wrecks more than just your metabolism and energy by causing inflammation, proper vagus function can dampen this inflammation cascade in the liver.

And it's not just the spleen and the liver. Let's review intestinal inflammation.

Healthy vagal tone has been shown to be vital in maintaining intestinal homeostasis and informing the CNS (*central nervous system*) about the immunological and nutritional status of the GI tract.

So we are talking about the vagus nerve and overall gut inflammation - not just the digestion and motility aspects of vagus nerve function.

The vagus nerve signaling from the gut microbiota links the emotional and cognitive center of the brain with peripheral function, can result in central nervous system disorders such as autism anxiety, depression, and so on.

Basically, this means that if you have microbiomes that are not working properly, it can directly impact your vagus nerve and that can lead to mood issues.

NEURAL REFLEXES AND INFLAMMATION

Recent evidence supports the idea that the central nervous system interacts dynamically via **the vagus nerve**. The brain itself interacts with the vagus nerve and the intestinal immune system to modulate inflammation residing in your gut through the humoral and neural pathways.

So the same way the vagus nerve controls dampens inflammation in your spleen and liver is <u>also</u> occurring in your gut.

Now, if you are someone who has chronic inflammation of your intestines where you experience:

- gut pain
- gas
- bloating
- leaky gut
- improper absorption
- autoimmune disease
- ulcerative colitis
- Cronh's disease
- or more

Intestinal inflammation is involved in all of those conditions.

And the vagus nerve directly impacts intestinal inflammation.

So, let's recap. Vagus nerve directly controls immune function and dampen inflammation at the liver, spleen and intestines through a neural-immune reflex arc. **This is BIG!**

This can be the reason why you may be doing "everything", but nothing is working and you are hitting a plateau. Your vagus nerve may literally be the missing piece of the puzzle.

WHY YOUR VAGUS NERVE STOPS WORKING

You may be curious about what causes the vagus nerves to not work in the first place...

STRESS

That's right - stress is a big one. Stress is 100% going to cause vagus nerve issues. This means learning to manage your stress is **monumental** for supporting your vagus nerve function, which as you may have noticed, affects your overall health in MANY ways.

But stress is not the only thing that can affect the vagus nerve.

Toxins, infections, fuel delivery issues, and hormone problems can all impact the vagus nerve.

To top it off, vagus nerve problem can start at the top (the top of your head that is).

For your vagus nerve to fire, it has to get a signal from somewhere first. It doesn't just go out there and fire on its own, whenever it thinks it should - it takes cues from a boss above...

...the brain!

Hence why traumatic brain injury often leads to decreased vagus nerve function. Or if you have Alzheimer's dementia, your brain begins to decline and degenerate, this also leads to vagus nerve issues.

In the gut, the enteric nervous system, otherwise known as *the second brain*, controls gut function via the vagus nerve. Neurodegeneration of the enteric nervous system can lead to not only GI problems, but also brain symptoms due to the bi-directional communication of gut to brain.

As you can see, vagus nerve problems are multifactorial, and therefore you need a roadmap that can systemically root out these causes.

WHY YOUR VAGUS NERVE STOPS WORKING

Your brain is a feedback machine that receives an input and generates an output.

What's the input? Environmental stimuli that are picked up through the 5 senses: sight, touch, taste, smell, hearing. These are sensory inputs and they go directly to your brain to tell you about your environment.

Just think of your brain like a big antenna that's taking in these sensory input signals and is interpreting them like a machine. It asks all the important questions.

Is this good for me? Is this dangerous?
Should I go toward it or away from it?

And based on that, it generates the output.

Fascinatingly, 90% of that output is parasympathetic - and 90% of that parasympathetic response is controlled by your vagus nerve, making the vagus nerve one of—if not **THE biggest influence of parasympathetic function in your body.**

So what happens if the signal your brain gets is some type of insult? Whether it be a traumatic brain injury, toxins, infection, stress, or metabolic issues, when the brain begins to get impacted by these things, it's going to have decreased neurological output, meaning that the brain no longer has as much say in what the response should be.

And this, of course, leads to decreased vagus nerve output. Because remember, the boss of the vagus nerve is your brain, it is your cerebral cortex. That's the feedback center.

And if the cerebral cortex is not working properly, this is where you're going to come across some problems.

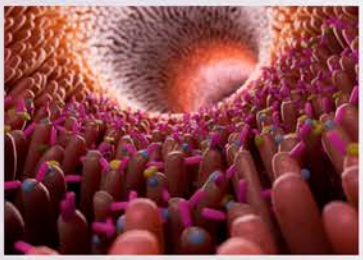
WHY YOUR VAGUS NERVE STOPS WORKING

Let's say that you have decreased vagus nerve function. Guess what follows - a gut function decrease that shows up as heartburn, reflux, gas, bloating, constipation, diarrhea, IBS, SIBO, candida, and so forth.

Why? Because as your gut motility slows down, and food just kind of sits there instead of moving down the GI tract. And when foods don't move through the gut, bacteria and candida feed on the food in a process called fermentation, which leads to bacterial and candida growth, as well as gas and bloating.

All of these problems derive from having decreased gut function due to decreased vagus nerve function. That is an example of the brain-gut connection becoming dysfunctional. You're also likely to struggle with **leaky gut.**

Why? Because when you are faced with decreased vagus nerve output, blood flow to the gut becomes compromised.



The gut lining is single cell layer thick and regenerates itself every 3 days. This process of self-renewal and healing requires tremendous amounts of fuel and nutrients, supplied by blood flow.

With decreased vagus nerve function, your blood flow to the gut will be **compromised,** which ultimately means that the gut lining is unable to regenerate - resulting in leaky gut.

And once you have leaky gut, you're going to experience an entirely different type of malabsorption and inflammation issues which can lead to increased sensitivities and potential autoimmunity.

Once you have leaky gut, chances are it's going to create problems with the blood-brain barrier, or so called leaky brain.

So decreased vagus nerve output leads to gut inflammation, which leads to brain inflammation, and leads to body inflammation. Essentially, you are left with systemic inflammation, which is one of the main drivers of chronic illness.

That's the brain-immune-gut dysfunction. The vicious cycle.

SYSTEMIC INFLAMMATION

Part of systemic inflammation is due to decreased vagus nerve function.

This is due to the previously mentioned decreased spleen, liver, and intestinal inhibition of macrophages and inflammatory cytokines.

When you have chronic inflammation, this dampens your innate immunity and decreases your ability to fight pathogen, leading to chronic infection.

When you become chronically inflamed, the illnesses follow - that could be arthritis, pain, gastritis, or whatever it may be - because chronic inflammation drives tissue damage. It also opens the door to autoimmune disease when you have both gut issues and systemic inflammation. It can be the driver of a new autoimmune disease, or be an ongoing trigger of an existing autoimmune disease you already have. This leads to a vicious cycle of chronic illness that you may have a hard time getting over.

When your tissues are constantly inflamed and damaged, eventually your organs and joints begin to degenerate. And yes, this is all a result of systemic inflammation. And that's not all, other things can come from this as well such as hormonal imbalances, for instance.

How does it impact hormonal balance?

Chronic inflammation causes your body to chronically pump out stress hormones such as cortisol, which leads to cortisol resistance, and can lead to insulin resistance. Both of these issues causes havoc with your hormones, including thyroid and sex hormones.

Chronic inflammation and cortisol elevation also disrupts your hypothalamus-pituitary-adrenal axis (HPA axis), which is the central regulator of all of your hormone function. This can lead to further hormone disruption, and circadian rhythm dysfunction.

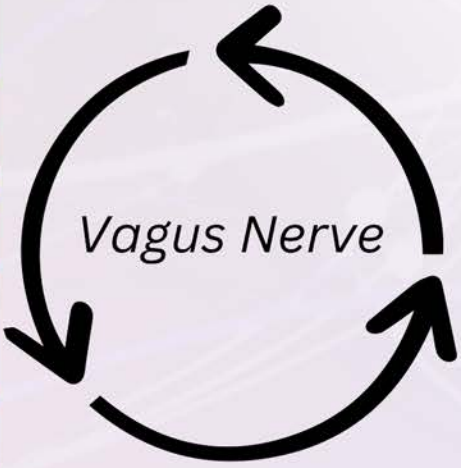
SYSTEMIC INFLAMMATION

All of these hormonal issues are going to eventually lead to metabolism problems, too. And when you have metabolism issues, you end up with **fatigue.**

This can be caused by mitochondrial dysfunction due to lack of fuel or damage from oxidative stress. Once your metabolism starts to get affected, you may start to see weight gain that you can't seem to shed off or even obesity. Or, on the other side of the coin, you may become underweight - it goes either way.

The main point here is that you just won't be able to have proper metabolism. This is the nervous system and metabolism connection, which I had coined the term **NeuroMetabolic Integration** back in 2009, because all of this is so intimately connected.

So again, you won't only have systemic inflammation but also brain inflammation that leads to body inflammation. It's all looped together.



The vagus nerve turns out to be one of the most integral pieces of this puzzle. It's in the middle of the loop and it's central much of the chronic illness that we see in the world today. It's not the only piece, but it's an important piece.

And this important piece is malfunctioning, you can have wide spread dysfunction and symptoms.

On the other hand, when its function is restored, it can integrate the brain, immune system, and the gut function. We can use that to our advantage to affect positive changes to help the body heal.

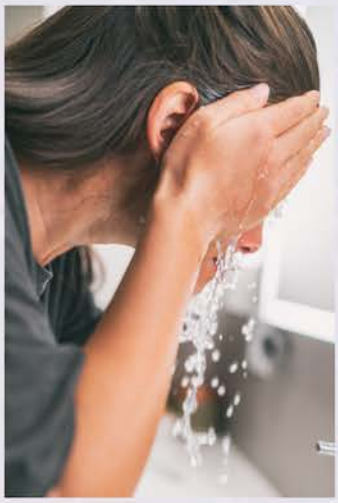
You can break the cycle. Know that it's not just about stimulating the vagus nerve. It's about understanding the BIG connection, and address the root cause in a systematic and step-by-step way that's proven to work.

4 WAYS TO STIMULATE THE VAGUS NERVE

4-part Diaphragm-Based Breathing. Deep breath in, from your diaphragm for 4 seconds, hold for 4 seconds, breathe out for 8 seconds, and hold for 4 seconds. The most important part of this is your slow exhale. You should be exhaling for twice as long as you inhale, in order to activate the lymphatic system, bring more oxygen into your blood and relax your autonomic nervous system. This will support your vagal tone and your peace of mind.

Meditation. While meditation has been used by many of the world's greatest leaders for centuries, for those new to meditation, I know it can feel like a daunting task. Where do you even start? Let me share a SIMPLE practice you can employ at the start and end of your day. While you're practicing your 4-part breathing exercise, why not choose a word or phrase to focus on? For instance, if you are concerned about your health, "My body is a healing machine, the universe makes it that way." Or just inhale on "I am grateful," and exhale on "I release all worries."

4 WAYS TO STIMULATE THE VAGUS NERVE



A Cold Water Splash. Splashing cold water on your face increases stimulation of the vagus nerve. While your body adjusts to the cold, sympathetic activity declines and parasympathetic activity increases.

Humming. Yes, humming. Because your vagus nerve runs through your larynx and pharynx in your throat, humming creates a gentle vibration that stimulates it and can increase vagal tone. So take a deep breath when your anxious - or just make it part of your daily routine, and hum a happy tune - your vagal tone will thank you!

There are numerous studies that support a long list of other tools, such as exercise, yoga, probiotics, massage, social connection and even laughter! I chose to focus on these four simply because they were easy to employ anywhere, at any time and would only take a few moments from your day.

* * * * *

Be sure to register and join us for the Vagus Nerve Masterclass to discover the astonishing power within you to transform your health and reclaim vitality! Gain exclusive insights, backed by cutting-edge research, on unlocking the key to optimal health, banishing chronic illnesses, and embracing a life brimming with wellness and joy.

And please share this link and invite those you love to join you at this free event and embark on a life-altering journey toward ultimate vitality: www.vagusnervemastery.com