The Neuroscience of Soothing Your Nerves

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Introduction

What does it mean to "rest" or "take a break" – really?

Is there a "right" or "wrong" way to do it?

Yes, there is a right way and a wrong way to rest, to soothe yourself.

But why? What possible basis can there be for making a statement like that?

To fully answer these questions, it's important to learn a few basics about how the human nervous system works – specifically, the Autonomic Nervous System or ANS. This is the system that controls whether and how our body enters a state of rest and relaxation.

The field of neuroscience is evolving rapidly and new scientific knowledge is only gradually making its way into education, medical practice, and mainstream awareness. Four specific ideas that are not widely understood have big consequences for how we understand the ANS. These are polyvagal theory, interoception via the lamina I system, allostasis, and neuroplasticity.

These ideas are not without controversy and will likely end up being improved upon as scientific understanding advances. However, they represent important and necessary shifts to the old paradigm: the view of the human ANS as a simple, almost mechanical, unconscious system that cannot change itself. In fact, there is a lot we can do to consciously support healthy functioning of our ANS through our beliefs, behaviors, and attention. The ANS can learn.

Another key concept, which is actually quite old and well understood, must also be brought into the discussion: regulation. Regulation is the property of any system to use feedback and control processes to bring itself into balance. For example, consider a central heating system in a building. When the room temperature gets too low, the thermostat turns on the furnace. When the temperature gets too high, the thermostat turns off the furnace.

This keeps the building interior close to the desired temperature. The ANS (ideally) works the same way to keep our activity and stress level under control, to balance effort and work with restorative rest. It's not about staying on a flat line 24/7, but it's about coming up and down within a comfortable and healthy window of tolerance. If we start to get too stressed out, our internal thermostat ought to kick in, telling us to take a break until we've settled down again.

To understand what can go wrong and why, let's go into those four neuroscience ideas. In the end we will find out that, no matter how unbalanced and stressed we might get, we can still create and solidify good ANS regulation habits. Nothing is set in stone – that's the fundamental lesson of neuroplasticity.

Polyvagal Theory

The polyvagal theory is the brainchild of Dr. Stephen Porges, neurophysiologist and psychiatrist. He spent decades studying the vagus nerve: the tenth (and longest) cranial nerve which wanders through many sites within the face, neck, and torso. The vagus has long been understood to be a major component of the parasympathetic or "rest and digest" state of the ANS. It was thought of as a single entity with a single parasympathetic effect. However, Porges showed the vagus nerve actually is composed of two distinct branches with distinct functions. Additionally, there is not just one parasympathetic "rest" mode controlled by the vagus, but (at least) two. Hence "poly" (many) "vagal".

The two physical branches of the vagus nerve are the dorsal branch and the ventral branch. They are named for the directions from which they emerge at the brain stem.

The dorsal branch of the vagus nerve is made of a primitive type of nerve fibers and goes low into the torso to serve the abdominal organs. Activation of the dorsal vagus conserves bodily resources and controls the digestive process. All animals descended from pre-reptilian ancestors have a similar structure, including modern reptiles and mammals. Other modern day animals have evolved uses for their dorsal vagus that allow extreme low metabolism states such as hibernation or long underwater dives.

The dorsal branch of the vagus is slow – there may be a full second before impulses reach their destination in the brainstem from the sensory ends in the belly. (Visceral sensory C fibers conduct impulses at 0.5-2 m/s, compared to fast-acting muscle control nerves which can reach 120 m/s.) It has fibers that go both ways – efferent and afferent, bringing information both to and from the brain stem and the organs.

The dorsal vagus is also a bit clumsy and simple. Rather than a fine-tuned system of continuously varying activation levels like more advanced types of nerve fibers, the dorsal vagus has two main "gears" or activation modes: high tone (high activation level) or low tone (lower activation level).

Here lies the difference between restorative rest and unhealthy immobilization.

The less healthy state, at least for ongoing use, is high tone activation of the dorsal vagus. The dorsal vagus goes into high tone when faced with a sense of helplessness before a perceived survival threat. Rather than mount a fight-or-flight sympathetic response, the ANS, in response to the dire situational perceptions of the brain, sees there is "no way out" – and shuts things down. In a real survival situation such as a predator attack, this can cause fainting or "playing possum" (a reflex also called death feigning). The high tone dorsal vagal ANS state is called "freeze", "shutdown", or "immobility with fear".

In humans, since our complex nervous systems allow for a lack of concordance or coherence in what different subsystems are doing, we may be able to perform many daily life routines while at least partially in high dorsal vagal tone. The physiology may become activated as a coping mechanism due to high stress or more subtle situations of learned helplessness. To maintain necessary activities and behaviors, the high tone can co-exist or ping-pong back and forth with a high sympathetic state, rather than coming on as intensely as a full death feigning response. This mild or intermittent shutdown state is called "functional freeze" – going through the motions of life, but with a sense of numbness, disconnection, and low energy. Over time, overuse of this mode increases the body's allostatic load, raising the risk of chronic health problems. (See "Nurturing Resilience" by Kain and Terrell, Chapter 7.)

Restorative rest and the traditional parasympathetic "rest and digest" state, on the other hand, occurs when the dorsal vagus is in low tone activation. Also called "immobility without fear", low tone dorsal vagal activation is associated with mammalian bonding behaviors such as cuddling and nursing. Oxytocin release has also been associated with low tone dorsal vagal activation. The ANS is in energy conservation mode, but not to the point of shutting everything down; in fact, in low tone dorsal vagal activation, digestive processes are stimulated such as gastric acid release and peristalsis. However, the body enters a mostly immobilized state where the body's tissue repair and maintenance or housekeeping processes can take over, instead of resources going towards mobilized activity and interaction with the environment. The signs of being in this state include healthy peristaltic movement in the GI tract, comfortable motionlessness with a sense of safety, and possibly emotions associated with oxytocin release and social bonding, like love and gratitude.

So, knowing about the dorsal branch of the vagus nerve and its two modes, what is the right way and the wrong way to rest properly? Clearly we need to encourage low tone dorsal vagus activation and avoid high tone (shutdown). All of the guided rest breaks on this website are designed to encourage low tone activation of the dorsal vagus, either directly or indirectly. It's what "soothed nerves" or "healthy rest" really means.

(You can actually stop reading this article here, if you like. In a way, the rest of the concepts here are just supportive ideas explaining what can assist the low tone dorsal vagus to naturally activate when it's time to rest.)

If you're still here, there's another important polyvagal piece, the other branch of the vagus nerve: the ventral vagus. Porges has called the dorsal vagus the "sloppy" vagus and the ventral vagus the "smart" vagus. It is an advanced (that is, more recently evolved) structure we share in common with other mammals.

The ventral vagus is composed of more complex and fast nerve fibers which bring our heart rate and sympathetic (fight-or-flight) activation down in a gradual, refined way. Essentially this is the healthy mechanism for coming down from a state of fight-or-flight – much more sensitive and gentle than the dorsal vagal shutdown response.

The ventral vagus is intricately connected with the physiology of social communication. In conjunction with other cranial nerves, the ventral vagal nerve connects to the throat and voice box to help produce our vocalizations and control the tone of our voice, to the ear muscles which allow us to tune into sound frequencies in the human vocal range and pick out distinct voices amid background noise, and to the facial and eye muscles which express our emotions on our face and make eye contact. Utilizing these functions activates the ventral vagus, and vice versa.

To summarize, the dorsal vagal shutdown (high tone activation) response is not healthy to use for everyday rest and stress relief. It will lower your heartrate and stress (arousal) level dramatically and can immobilize you so you feel you are resting, but it is too crude: it shuts down the bodily housekeeping functions that come online during healthy rest. The best way to soothe your nerves is by utilizing low tone activation of the dorsal vagus ("rest and digest" mode). The ventral vagus should be exercised and developed as much as possible, since it brings down our stress level in a safe-feeling, more controlled way and thus supports low tone dorsal vagus activation. Social engagement using skills like listening, vocalizing, looking around, and making facial expressions stimulates the ventral vagus. Ventral vagal stimulation and low tone dorsal vagal activation are distinct subsystems, but ideally they work in concordance and are mutually reinforcing.

Interoception and the Lamina I System

Interoception might sound like a funny word, but it is a simple idea: internal (intero-) perception (-ception).

Just as we have sense organs like eyes and ears and skin touch to sense our outer environment, we have internal systems that sense our inner environment, our body state. This feedback from body to brain is fundamental to healthy regulation. The first step to bring balance is to notice when something is out of balance.

Full-body interoception is an intrinsic part of the ANS, our sense of self, and of our emotional experience. A. D. (Bud) Craig's work has illuminated a key to interoception and regulation: the insular cortex in the brain and the lamina I system which feeds body information into it.

The lamina I is a section of the spinal cord that relays signals from the body to the brain. Along with the dorsal vagus nerve body-to-brain (afferent) fibers, it is a major source of internal information that our brain needs to make adjustments to body functions and keep us in healthy balance.

Bud Craig found that virtually all tissues of the body, including skin, muscles, joints, and bones, are sensed by very small nerve fibers. These fibers can sense temperature and mechanical deformation (nociception) as well as biochemicals indicating internal metabolic and energetic conditions (lactate, ATP, etc). Although the "pain sensing" thermoreceptor and nociceptor functions were the most widely understood and accepted purposes of the fibers, Craig discovered that they were not the whole story.

These pervasive small-diameter nerve fibers are slow C fibers, just like the dorsal vagus – they operate at a slower tempo than other parts of the nervous system. Contrary to neurology conventional wisdom, they send signals to the brain under a wide range of normal operating conditions, not just when something is wrong. Together with other bigger and/or faster sensory nerve fibers, they feed into a particular part of the spinal cord – the lamina I pathway. Then most interestingly, the lamina I system brings all this interoceptive information into the very brain structure where it appears that “feelings” originate – the insula.

How does interoception relate to feelings? Building upon early ideas of how homeostasis (regulation) works in humans and similar animals, Craig argues that “feelings” – a general word that encompasses body sensations, emotions, and instinctive impulses – provide a sort of common currency that controls our brain’s attention. The stronger the feeling, the more attention we pay to it, and to whatever the feeling is pointing towards. In particular, “homeostatic” feelings are produced based on interoception.

Interoception provides feedback via feelings that drive our behavior to maintain bodily balance and integrity. Examples might include pain with aversion to some particular harmful stimulus, attraction to good food and safe pleasant environments, or getting tired after fatiguing the muscles with physical activity. While this is an old idea, Craig was the first to illuminate the precise neural pathways by which many of these self-regulatory processes actually take place, showing that information from the whole body helps to generate these homeostatic feelings.

What does this all mean as far as soothing our nerves, finding true rest, and settling ourselves down? It means that we need to start respecting the regulatory functions of our homeostatic emotions, instincts, and internal body sensations.

It shouldn’t be very difficult to rest and restore ourselves whenever needed. Animals have this ability built-in, hardwired. So do we! But as brainy humans, we can learn how to override our homeostatic emotions and urges. In order to get back to instinctive natural rest and relaxation, we need to unlearn what we learned – to give the power of our attention back to interoceptive awareness.

Nurturing present-moment body awareness and learning to sense and follow our most basic self-care instincts rebuilds this neural system. (See Interoception: The Eighth Sensory System for many specific skill building tools that have been developed in the context of occupational therapy.) In my personal opinion and experience, taking regular breaks or pauses for bringing in a slowed down tempo in our attention and our activities can dramatically support the homeostatic interoception process. I speculate that slowness is needed mainly due to the slow C-fiber nerves involved, so that thoughts and behaviors can sync up with those interoceptive feedback circuits.

Interoception via the lamina I is a subsystem that ideally works in concordance with the low tone dorsal vagus and ventral vagus subsystems to downregulate sympathetic activation and let the body drop into restorative parasympathetic rest.

Allostasis and Neuroplasticity

Before tackling neuroplasticity, let us bring in another concept: allostasis.

I have used the word "homeostasis" as in Bud Craig's homeostatic emotions, as almost a synonym for regulation. But homeostatic regulation is only one kind of regulation: a simple kind. Homeostasis sees system regulation as a straightforward process of directly compensating for whatever is out of balance. Mild dehydration... feel thirsty and crave a drink... drink water. Solved.

Allostatic regulation, in contrast, is more complicated. In allostatic regulation, the body system has multiple intertwined subsystems that do not have to be in their ideal range all the time; moreover, there is a conscious brain which can anticipate future conditions and adjust those subsystems accordingly. In allostasis, you might have the following:

Mild dehydration... realization that due to a local drought, water is likely to be scarce for a time... various bodily systems adapt to a new dry-climate reality (thirst is more easily ignored, less salivation and mucus production, kidneys start conserving fluids more, etc).

In a perfect world, allostasis helps us survive the drought and then we go back to normal homeostatic function after the rains come again.

Chronic stress (getting stuck in sympathetic activation), functional freeze, troubles with interoception and self-care instincts, other patterns that make it hard to achieve restorative rest – these are all allostasis at work. Although the body is capable of maintaining such allostatic patterns to survive periods of dire need or unsafety, allostasis does not represent healthy regulation for the body. The body needs restorative rest and low tone dorsal vagal activation to repair, maintain, and nourish itself.

In other words, if you're mildly dehydrated, it's really a lot healthier to just drink some water, rather than subconsciously convince yourself that you live in an unforgiving world of dryness to which you must adapt.

As neuroendocrinologist Robert Sapolsky shows in his popular book "Why Zebras Don't Get Ulcers", the psychological dimension of how we perceive, appraise, and anticipate stressors changes our physiological stress response. He discusses specific psychological and behavioral factors that have been shown to be important for achieving healthy regulation in the face of stressful situations:

- a sense of control (i.e. empowerment, internal locus of control, self-efficacy, problem-solving or growth mindset; this factor is also related to the predictability of the environment and/or the stressor)
- social support (i.e. supportive relationships, physical touch, emotions of love and connection; I would include ventral vagus stimulation here)
- outlets for frustration (free emotional expression, large muscle movements to complete procedural instincts of the sympathetic response, some form of displaced aggression – hopefully a victimless form, like playing a sport!)
- perception of things as generally improving rather than worsening (or the ability to alter one's perception of the stressor in an optimistic way)

These factors give a sense of what an ideal short-term coping strategy would look like – how someone could get through a rough patch in life without establishing a troublesome allostatic pattern. However, when you have allostatic stress patterns already, it's not like you can snap your fingers and instantly adopt those healthy adaptive traits instead. How to get from allostatic Point A to homeostatic Point B? The answer is neuroplasticity.

Neuroplasticity is the ability of neural networks of the brain and nervous system to change and reorganize throughout the whole lifespan.

Neuroplastic learning is a double edged sword – the same way we can learn any new skill, we can learn allostatic coping strategies that make it difficult to rest properly. We then need new neuroplastic learning or re-wiring to get back to healthy regulation, so restorative rest can come naturally once again.

To go back to the water-drinking example, maybe you used to be good at staying hydrated, but then you went through a stressful work or school environment where you had long work periods with no water or bathroom breaks. After a year or so, you adjusted. Now you find yourself habitually ignoring your thirst signals and it's harder than expected to break the habit and listen to your body. How can you change back to how you were before; how do you neuroplastically re-learn to follow those body signals?

Let's get a little technical for a moment. How does neuroplasticity work on a cellular, neuronal level? There are three known mechanisms:

1. New connections (synapses) can get created between existing adjacent neurons, so that new pathways or circuits or activation networks can be formed that did not exist before. (And the other side of the coin, existing synapses can be inhibited to the point of apparent disconnection.)

2. Weak existing connections can get wired-in so they can fire more easily (potentiated) with repetition/practice. This means a once-new, fragile, weak pathway can become deeply ingrained to where it fires quickly, strongly, and automatically.

    - This process is assisted by the disuse and/or inhibition of competing pathways (pruning away the competing pathways). On the other hand, old disused pathways may also become "unmasked" by the right stimulus in some cases.

3. Entirely new neurons can be created throughout adulthood, under certain circumstances and in certain parts of the brain.

If that is neuroplasticity, how can we achieve it? Does it happen on its own or do we have to do things a certain way to allow neuroplastic learning to take place? What are the practical dimensions of neuroplastic learning?

Psychiatrist Norman Doidge explores neuroplasticity in his best-selling books, “The Brain that Changes Itself” and “The Brain’s Way of Healing”. The applied, practical view from Doidge is that neuroplastic learning works best under certain conditions: slowness and simplicity of the task at hand in the early stages of learning something new; a sufficiently high level of motivation and interest, which is also supported by making the tasks simple, accessible, and immediately rewarding; and especially for adults, focused attention.

Later on, as skills develop, paying attention to subtle differences (differentiating) allows for more complex mastery – the neural circuits themselves also differentiate and become more complex. Finally, when the pathways are well entrenched, the task or skill may be performed quickly and without as much conscious attention.

The way children learn during critical periods of development involves large amounts of neural growth, and brain chemicals called neutrophins and neutrophin factors which support that growth. This type of neuroplasticity allows children to learn very rapidly with only passive, low effort engagement, driven primarily by sense of play and curiosity. Interestingly, adults can sometimes achieve similar states. Also, regular aerobic exercise (30 minutes a day) has been shown to increase neutrophin factors in adults.

On a practice-oriented level, much can be gleaned from the teachings of Moshe Feldenkrais, a pioneer of neuroplastic movement techniques who Doidge discusses at length in “The Brain’s Way of Healing”. Feldenkrais developed a whole suite of body movement-based learning techniques, usually very simple movement patterns broken down into unusual combinations and performed at a very slow tempo with close attention to sensation details.

For adults, it appears that highly neuroplastic states where great changes occur often involve child-like emotions of wonder, curiosity, or wide openness to what is possible. The feeling is much like what Zen Buddhists call beginner's mind (in a beginner's mind, the possibilities are many; in an expert's mind, the possibilities are few). The attention level is high, but without force, effort, or willpower – instead it is easy, playful, or even cosmic. Such states are highly experiential and there is not much research here, just dramatic personal stories, some of which Doidge discusses in "The Brain's Way of Healing".

My own experience accords well with Feldenkrais's approach, and I have also experienced similar deep neuroplastic states during other types of therapeutic work and workshops which involved similar themes of non-force, curious openness, a sense of safety and play, slow tempo, and high attention to subtle nuances of movement and feeling.

Whether pursued in dramatic sessions of deep neuroplastic openness, or simply through diligent repetition with conscious attentive focus, neuroplasticity can shift the ANS out of allostasis. With neuroplastic change, the brain consciously avoids activating the old reaction patterns and creates the pause or space that allows the nervous system to fire in new patterns. Once new patterns are formed, they can be reinforced with repetition over time until they activate quickly, automatically, with a strong signal rather than with the muddy, fuzzy quality often felt with brand new patterns.

If the goal is to uncover an old pattern, such as getting back to drinking water after going through that "dry" phase at work or school, a single breakthrough experience that unmasks the old neural pathways may be sufficient. However, if there is a lifetime of never noticing thirst due to early childhood neglect, neurodivergence, or similar reasons, then whole new circuits will need to be built. This is indeed possible, but it takes longer and may require far more ongoing attention than it would for someone who had good hydration habits as a child.

Exercises such as body awareness exercises can be used to create long-term neuroplastic change when done attentively and repetitively for at least a couple of weeks. Sometimes, if the right state of deep slow curiosity and possibility can be achieved, big changes can happen quickly, especially if the desired ANS regulation patterns already exist somewhere in the circuitry and merely need to be unmasked.

For a sense of the timeline involved here, according to Doidge's stories, two to three weeks of daily repetition is probably the minimum to achieve a lasting new change in brain maps and behavior habits. The most extreme levels of rewiring require months to years of progressive learning. Major neuroplastic changes like totally rewiring the sensory nerves of the hand have taken 144 days in monkeys. Paralyzed adult stroke victims have recovered after about a year of full-time practice (in the case of Paul Bach-y-Rita's father), with partial paralysis cases gaining significant function back over at least two weeks of full-time practice (Taub's Constraint-Induced therapy). Doidge's books contain many more stories and examples. Neuroplasticity is highly individual and it is difficult to make specific claims about what is possible for people in general. Motivation and persistence appear to be key factors.

Finally, another point about neuroplasticity. There are multiple stages to the neuroplastic change process and understanding how they work can be very helpful. For one thing, the brand-new-connections-forming stage described above can be quite tiring and requires a recovery period. Yes, learning to rest properly can actually be tiring! Small cycles of the neuroplastic process are easiest to process in terms of downtime and recovery (even as little as a few minutes at a time).

Doidge describes the follow stages of neuroplasticity.

(Please note: I have taken liberties with Doidge's descriptions to provide my practical interpretation of the stages based on my own experience. My understanding is also informed by my participation in Irene Lyon's online SmartBody SmartMind course, though my descriptions here are my own and differ from hers as well.)

1. Neurostimulation: input or stimulation to the nervous system, for example by attempting an exercise or task, feeling sensory input consciously, or otherwise focusing one's attention, movement, or effort. Neurostimulation includes firing into new circuits, unmasking latent circuits, waking up underutilized quiet circuits, and exercising existing neural networks. It requires some sympathetic activation for alertness, and thus uses up some (or a lot) of the brain and body's fuel and energy. Anything that feels intense, challenging, and unfamiliar is highly neurostimulating, and is a good sign to proceed in small doses. Many times we want to push ourselves to the most complex level as fast as possible, but for ideal neuroplastic change, it is better to recognize when the right amount of neurostimulation has been achieved and then move to the next stage.

2. Neuromodulation: the yin to neurostimulation's yang, neuromodulation is the phase where the stimulated neural circuits stop firing and just calm down. If the stimulation doesn't have a chance to modulate and come down, it will increasingly generate noise (random firings) in the brain and not help long-term learning happen. Learning when and how to neuromodulate will not only help your ANS regulation, it will help you learn to do everything! Do not "push through" – take a break and modulate once you've experienced a good stimulation.

3. Neurorelaxation: this is an important step. When big neuroplastic changes begin to solidify, the whole body goes much deeper into a neuromodulating downregulation cycle. I believe this is especially noticeable if one has experienced an intense neuroplasticity session that seemed to bring a big sudden change, but also happens cyclically after a period of time doing incremental neuroplastic work with many small stimulation/modulation cycles. It can seem like just as you really started to make some progress, you are suddenly exhausted and need to sleep and rest all the time, and feel suddenly averse to doing the work of the program you had been doing diligently. This is sometimes taken as a sign of failing, plateauing, going backwards, or the process not working anymore. In fact, it is often a sign of huge progress! The

body is entering a deeply restorative state. The brain is working on pruning off unneeded old neural pathways and consolidating the new pathways. Following your instincts to rest, take time off the program, and take it easy at this stage will pay off later. I consider this more of an integration stage than a relaxation stage. It is essential to building a new habit at a deep level. Give it time (days to weeks), track your experience over time, watch for the tired feelings to pass and for the emergence of a renewed sense of readiness to re-engage – this will bring on the next stage.

4. Neurodifferentiation: after new circuits have been laid down pretty well and old circuits have been pruned out a bit, and the body has restored itself after a big relaxation or integration phase, it is time for differentiation – refinement of the new circuits. At this stage the same types of exercises or tasks that were previously challenging feel much easier, there is more confidence, and subtle nuances may be noticed that were beyond comprehension before. The skill or function improvement often happens in a step-wise leap rather than the slow-but-steady progress that happened earlier with repetitive stimulation/modulation cycles. Note that this leap occurs AFTER the neurorelaxation, integration stage. Neurodifferentiation is often less energetically taxing than the initial challenging neurostimulation, but can also be a stepping stone to a new cycle of neurostimulation at a more advanced level. The old program or style of work will likely need to be updated to create renewed interest and sufficient stimulation.

(Doidge also describes a preliminary stage of general nutritional/physical support for the neurons and glia: basically, correcting any dietary or environmental problems, and getting enough sleep and exercise. As noted previously, 30 minutes of aerobic exercise per day is associated with higher levels of neuroplastic brain chemicals in adults.)

The more regulated we get, the easier it is to smoothly shift through these neuroplastic phases and bring lasting change to the brain and nervous system. Unnecessary survival responses of fight-or-flight sympathetic arousal and/or high-tone dorsal vagal freeze can be attenuated slowly with practice. Everyday safety responses of low-tone dorsal vagal rest-and-digest and ventral vagal engagement can be cultivated slowly with practice. Over time it gets easier and easier, since the learning process itself accelerates with improvement in regulation. Dramatic overnight changes may occur if the right support and conditions are there, but even overnight changes require integration time and follow-up refinement to stick. Slow and steady wins the race over the weeks, months, and years it takes to neuroplastically shift old ingrained allostatic habits.

Conclusion

Let's hearken back to the beginning of this article. What does it mean to "rest" or "take a break" – really? Is there a "right" or "wrong" way to do it?

Yes, there is a right way and a wrong way to rest, to soothe yourself.

The wrong way is stuck in old allostatic coping strategies, cut off from the homeostatic interoceptive feelings that make restorative rest natural and easy, and using the survival physiology of high tone dorsal vagus ("freeze") to apply the parasympathetic brakes and calm the body.

The right way is with low tone activation of the dorsal vagus turning on all the rest-and-digest bodily housekeeping processes. This healthy restorative rest is supported by the ventral vagal sense of connection and relationship and safety, and by the interoceptive instincts and feelings from the lamina I system, dorsal vagus, and other slow sensory nerve fibers.

If resting the "right way" is not happening on its own or is very difficult to achieve, bringing focused attention to simple practices that support resting properly – like helping yourself feel safe, building interoceptive body awareness, and taking pauses and interludes of operating at a slower tempo – can remind the nervous system how to do it. It may take repetition and intentional, attentive practice, but over the course of weeks to months to years, neuroplasticity works to create deep changes.

Current neuroscience tells us the ANS which soothes our nerves is a self-changing, adaptable, dynamic system which responds dramatically to our beliefs and choices. Learning about the system is sometimes one of the biggest steps in creating healthful changes and better regulation. Learn to rest, learn to soothe your nerves, and enjoy life!

Books Cited and Recommended Reading

Polyvagal Theory

The Polyvagal Theory, by Stephen Porges

Nurturing Resilience, by Kathy Kain and Stephen Terrell

In an Unspoken Voice, by Peter Levine

Interoception and the lamina I system

How Do You Feel?: An Interoceptive Moment with Your Neurobiological Self, by A.D. (Bud) Craig

Interoception: The Eighth Sensory System, by Kelly Mahler

Allostasis and Neuroplasticity

Why Zebras Don't Get Ulcers, by Robert Sapolsky

The Brain that Changes Itself, by Norman Doidge

The Brain's Way of Healing, by Norman Doidge