

## The Importance of the Vagus Nerve

Written by Michelle Parker, D.C.

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The vagus nerve is the tenth cranial nerve, and has the most extensive distribution out of all of the cranial nerves. Named for its tendency to wander, the vagus nerve acts like a central switchboard, sending out nerve impulses to and from the brain and most of the organs in our body. Its main role is to calm us down by activating the parasympathetic nervous system.

The vagus nerve, derived from the brainstem, is diverse, providing sensory, special sensory, motor, and parasympathetic innervations. The human brain extends down to form the brainstem and then to form the spinal cord. The brainstem controls and regulates vital body functions such as respiration, heart rate, and blood pressure. The vagus nerve emerges from the brainstem, exiting the skull through a small opening called the jugular foramen. From there, it reaches the ears, throat (pharynx and larynx), tongue, stomach, intestines, heart, liver, spleen, pancreas, gallbladder, kidneys, ureter, and reproductive organs. Research continues to reveal even more.



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Conditions resulting from vagus nerve impairment are numerous and diverse. Starting with the brain, some of the most common disorders are anxiety and depression, which can be traced directly to the vagus nerve. Sensations of the middle and external ears are performed by it. Disturbing this ear pathway can contribute to ringing in the ears (tinnitus). The vagus nerve is responsible for the swallowing and the gag reflex of the pharyngeal muscles. Hoarseness or dysphagia (difficulty in swallowing) can be present with impairment of the vagus nerve.

The vagus nerve also innervates the laryngeal muscles, known as the voice box. Abnormal articulation of speech, such as dysarthria, may also arise with vagus nerve disorders. Disorders of speech and swallowing can be very disabling, or even fatal. In the tongue, the vagus nerve is involved in the ability to taste and to produce saliva, which initiates proper digestion of food. In the stomach, the vagus nerve increases stomach acidity, digestive secretions, and gut flow. Having less vagus activation can increase the chances of irritable bowel syndrome (IBS). Vagus nerve stimulation enhances the release of histamine in stomach cells, which releases stomach acid. Low stomach acidity is partially a vagus nerve issue. Disorders related to low stomach acidity include gastroesophageal reflux disease (GERD), heartburn, inflammatory bowel diseases such as Crohn's and ulcerative colitis (UC), and gastroparesis (stomach paralysis). Parasympathetic stimulation of the vagus nerve intensifies the muscle tone, strength, and peristalsis of the intestines.

Research on vagus tone (response) suggests vagal activation to be associated with infant growth and weight gain. In a study of preterm infants, researchers found an enhancement of gastric motility by stimulating vagus activity, leading to more efficient food absorption and ultimately greater weight gain. At the heart of the matter, the vagus nerve controls heart rate and blood pressure. Vagus stimulation will decrease the risk of heart disease. Reinforced vagus nerve tone enhances general kidney function by increasing blood flow filtration, releasing amounts of dopamine in the kidneys, and excreting sodium—and by doing so, lowers blood pressure. It is well-documented that vagus nerve activation will release acetylcholine, which decreases inflammation in targeted organs. However, when mobilized in the spleen specifically, the overall inflammation response is more systemic. Additionally, our reproductive organs are affected by it; for women, this involves the cervix, uterus, and vagina, thereby playing a major role in fertility.

If we can learn to stimulate the vagus nerve, we can promote calmness and a better sense of harmony in our nervous system, allowing the body to “rest-and-digest,” which, in turn, promotes healing, growth, and joy. The strength of the vagus response can be measured by heart rate variability (HRV).

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It is not surprising that vagus nerve impairment can wreak havoc on many organ systems, creating numerous devastating conditions and problems.

## **The Impact of Stress**

Stress is a major battle and a reality we fight in modern life. The pressures and demands on mothers and fathers to always be perfect and strong is unrealistic. Society exerts demands on how we are expected to act as parents. We work longer hours, we are bombarded by terrifying news of wars and deadly shootings, and we face pressures to keep up with the times. Children, meanwhile, are assigned endless amounts of homework.

The stressors we encounter and struggle with every day are real. We wonder why so many of us are experiencing mild to gut-wrenching levels of anxiety and depression. Poor diet, an overload of toxic chemicals, consumption of unhealthy food, use of synthetic personal-care products, air pollution, lack of quality sleep, not enough exercise, and negative thinking can all tip the scale toward overload and imbalance and inhibit our ability to recover. If we neglect our physical and emotional health, we can send our body into overdrive.

## **Chiropractic and the Innate Intelligence**

Dr. Tashiro Ogura, a chiropractor and Ph.D., along with six medical doctors and fellow Ph.D.s, demonstrated in a study the dramatic effect one chiropractic adjustment can have on the tone of the nervous system. With positron emission tomography (PET) scans, they showed that regional metabolic brain changes had occurred, and the sympathetic tone of the nervous system had decreased. Taking saliva samples, test subjects showed a decrease in overall amounts of salivary amylase, indicating a decrease in fight-or-flight physiology. Muscle tone and pain intensities also decreased, literally taking pressure off the spine. All of these results revealed the positive impact of a chiropractic adjustment to the autonomic response.

Another study, published by Dr. John Zhang and his colleagues, proved the effectiveness of chiropractic adjustments to improve vagus nerve activation. Patients who received regular chiropractic care showed improvement in their heart rate variability.

How can heart rate variability be improved with vagus nerve activation? Remember, the vagus nerve exits the skull through the small opening called the jugular foramen. Any alteration of the

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shape or size of the foramen can cause compression or stretching of the cranial nerves as they pass through this limited opening. Dr. Hal Blumenfeld elaborates on the causes of disorders to the vagus nerve, ranging from lesions in the brain from the upper or lower portion, to damage to the neuromuscular junction or the muscles themselves. Muscle pressure or tension on the bones of the skull may change the shape of the foramen opening. This tension can happen anywhere: the top of the head, tightness along the neck, spasms in the upper back, or strain and stress on the low back. Stimulation of the pressure receptors enhances vagus activity through tactile and kinesthetic touch, as found by Dr. Tiffany Field in her research paper “Stimulation of Preterm Infants.”

## The Paradox of Balance

Life is not and cannot be perfect. Peter Kevorkian, D.C., a brilliant doctor, husband, and father, said this during a presentation I attended: “You mothers need to stop trying to find balance in life. You will never find it.”

I thought that Dr. Peter had lost his mind. He stood in front of a classroom, evenly on both feet, with correct posture, silent and still. He explained that he had found the perfect balance at that moment in time, but if he wanted to move forward, he would need to lift one of his arms, start raising his opposite leg, contract certain muscles and lengthen others, in order to physically take a step. There he stood, one leg in front of the other, imbalanced, but in a stance poised to move forward.

I will never forget this presentation. Well-adjusted people do not necessarily have less stress in their lives. Their nervous systems are just better equipped to handle the demands required to move forward. They have learned methods and actively do things that help manage their stress and increase their flexibility. This is the power of chiropractic. By eliminating interferences within the cranium and spine, chiropractors help us find our body’s natural harmony, what nature created for our survival—our innate intelligence.

Pain can be a signal for positive change. When we feel like the world is pressing in, let’s remember what lies behind that feeling. The vagus nerve, and the nervous system at large, innervates all body systems, including those underpinning social interactions, and that we truly can reach a life of freedom, joy, and wholesome wellness if we appreciate the ways we can bring our nervous systems into alignment.

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