

OPTIMAL HEALTH UNIVERSITY™

Presented by Katie Gravesen, DC

Chiropractic & the Autonomic Nervous System Part I: the Basics

A growing body of scientific evidence demonstrates that chiropractic care may benefit the nervous system. This is great news, since the nervous system controls all body functions and is integral in disease prevention. In recent years, researchers have focused particularly on the effect of chiropractic care on a critical branch of the nervous system known as the autonomic nervous system.

Dr. Gravesen is committed to keeping patients on the research, which may have a dramatic impact on their current and future health.



What is the ANS?

Dr. Gravesen explains to patients that the autonomic nervous system (ANS) controls organ function and overall balance of the body (homeostasis). For the most part, the ANS is not under voluntary control. However, some of its functions, such as breathing, may be influenced by conscious control.

The autonomic nervous system (ANS) is a regulatory branch of the central nervous system. It adjusts or modifies some functions in response to stress. It helps regulate heart activity, blood vessels' size, blood pressure and air flow in the lungs.

The ANS also regulates stomach function, intestinal function, salivary gland activity, the secretion of insulin, uri-

nary activity and sexual function.

Components of the ANS

Classically, the ANS is considered comprised of two major divisions: the sympathetic nervous system and parasympathetic nervous system. However, in recent years, many scholars have added a third component: the enteric nervous system. On the other hand, some experts maintain that the enteric system is autonomous from the ANS.

The sympathetic nervous system (SNS) is considered the body's "flight or fight" mechanism. It is activated under times of stress, and is responsible for pupil dilation, and increased heart rate, blood pressure and sweating.

The parasympathetic nervous system (PNS) is the body's "rest and digest" mechanism. It works in tandem with the SNS to keep the body in balance. It slows the body down and is responsible for longer-term functions, such as digestion.

It is vital to well-being that these systems operate in synergy. If the body was a car, the SNS would be the acceleration pedal, while the PNS would be the brake.

The enteric nervous system (ENS) is responsible for gastrointestinal actions.

How Is the Spine Related to the Nervous System?

The spinal cord is a major constituent of the nervous system. It is housed in the protective shell of the spinal column. The spinal column consists of bones called vertebrae that are stacked one on top of the other and separated by flexible discs. This ingenious construction facilitates mobility while maintaining structure.

Nerves flowing to organs, muscles and structures throughout the body emerge from and return to the spinal cord. These nerves enter and exit through small canals between spinal bones. And, research reveals that some spinal nerves actually attach directly to vertebrae via miniscule ligaments (*Spine* 2005;30:601-5).

Doctors of chiropractic, like Dr. Gravesen, theorize that subtle alterations in the spine and surrounding structures may interfere with nervous system activity. For instance, studies show that even slight spinal degeneration may inhibit nerve flow (*J Manipulative Physiol Ther* 2003;26:426-37).



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Vertebral Subluxations & the ANS

Vertebral subluxations are areas in the spine where function is restricted or bones are slightly out of place. Research links vertebral subluxations with a litany of disorders — from Parkinson's disease and infertility to headaches and carpal tunnel syndrome.

Investigators reason that inhibited autonomic nervous system (ANS) function due to vertebral subluxations may be the connection between the spine and such a vast array of health challenges. After all, the ANS helps regulate the body's organs and overall homeostasis.

How might vertebral subluxations hinder the ANS? One analysis indicates that spinal dysfunction activates a specific neural pathway, which derives from the gray matter of the mid-brain (*Man Ther* 2001;6:72-81). However, there are probably multiple pathways involved.

Adjustments & the ANS

At this chiropractic office, the doctor corrects vertebral subluxations with safe and gentle maneuvers called *chiropractic adjustments*.

Just as vertebral subluxations may hinder ANS activity, researchers theorize that chiropractic adjustments may assist this crucial system.

Back Injury May Alter ANS Function

Common injuries linked with vertebral subluxation, including back injuries, may alter ANS function. One study tested six people who suffered an injury during the previous seven days. (Three endured low-back injury, two knee injury and one shoulder injury.) The subjects were compared with six individuals without such conditions.

The participants were evaluated for various indicators of autonomic nervous system action, such as fluctuations in blood pressure and skin temperature. Researchers detected signs of

altered ANS function among injured patients, compared with injury-free volunteers.

“Although this is a small preliminary study, there appears to be a relationship between acute musculoskeletal tissue injury and the autonomic nervous system in human subjects.” (*J Manipulative Physiol Ther* 2005;28:44-51.)

ANS and Headache

The ANS also plays a role in other maladies associated with vertebral subluxation, such as migraine headache.

One analysis enrolled 30 patients. While they were undergoing a migraine attack, researchers used an electrocardiograph (ECG) to ascertain their heart function.

ECG abnormalities were common during a migraine attack. And, the specific results seen indicate an interference in the regulation of the circulatory system, associated with a disruption in the autonomic nervous system (*Headache* 2003;43:861).

What Does This All Mean?

If, as the preliminary research suggests, vertebral subluxations may impair autonomic nervous system activity — and chiropractic adjustments may facilitate ANS activity — then the health-related implications could be staggering.

The ANS plays a pivotal role in regulating organ function. In theory, any disorder involving an organ or the body's regulatory process could be tied with vertebral subluxations. In turn, the prevention and resolution of these disorders may be linked with removal of vertebral subluxations via chiropractic adjustments.

How Do Scientists Test If Vertebral Subluxations and Chiropractic Adjustments Influence ANS Activity?

Additional research is needed to prove this theory, but investigators are ex-

cited about the growing body of evidence supporting it, as is this chiropractic office. We are looking forward to keeping patients on the ongoing experiments, which promise to reveal more about the link between the ANS, vertebral subluxations and chiropractic adjustments.

To determine if vertebral subluxations and chiropractic adjustments influence the ANS, scientists look at two factors: 1) If these events are related to conditions affecting the organs. 2) If these events produce specific, often immediate, changes characteristic of ANS activity, such as alterations in heart rate variability (HRV), blood pressure, blood flow, pupil dilation and breathing.

As to the first question, there is mounting scientific evidence that vertebral subluxations may trigger conditions involving the organs, and that chiropractic adjustments may alleviate these conditions. These disorders include hypertension, diabetes, infertility, asthma and bed-wetting (*J Vertebral Subluxation Res* 2009:1-5).

“There are promising studies demonstrating that spinal adjustments can influence various physiological parameters, such as HRV, blood flow, and blood pressure,” concludes a recent, comprehensive review on the subject (*J Vertebral Subluxation Res* 2009:1-5).

To learn about the specific results of individual experiments, pick up a copy of next week's *Optimal Health University™* handout, *Chiropractic and the Autonomic Nervous System Part II: the Latest Research*.

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