



# THE CIRCULATING NERVOUS SYSTEM

## The Role of Chiropractic in Immunity

The body has the ability to heal itself and chiropractic theory says that when the nervous system is free from obstruction the body can respond more effectively resulting in improved overall health.

Chiropractic is about removing obstructions to the proper functioning of the nervous system, improving connections and the flow of information. These obstructions are caused by shifts in the bones (vertebra) that make up the spine and these shifts obstruct the nervous system and create an obstruction and a disconnect. Because the nervous system controls and coordinates all functions in the body, obstructing or disconnecting it can have an effect on every function of the body - and it often does.

These obstructions are referred to as **vertebral subluxations** in the scientific literature and adjusting them is how chiropractic removes those obstructions and helps people stay connected and healthy.

A person's body repairs damage, fights or prevents

infection and destroys cancer cells through the activity of the *immune system*. For a number of years researchers and neuro-immunologists have described the immune system as a continuation of the nervous system and stated that immune cells are simply a *circulating nervous system*. These claims have been made based on the fact that the nervous system plays such a crucial role in alerting and guiding immune system cells to where damage or an infection is located.

The nervous system is also responsible for localizing the immune response to the specific site of damage or infection. Localization of immune activity prevents a systemic or a greater immune response than the body needs. When this doesn't happen people get what are called *autoimmune diseases* - where the body essentially attacks itself.

Although scientists have known about the nervous system's role in regulating the immune system for years, this concept has finally come to the forefront of scientific research.

Recently the focus of science has shifted from

viewing the nervous and immune systems as separate entities to recognizing that the brain utilizes specific paths to the immune system for the purposes of guiding and controlling the immune response.

There is a two way communication between the nervous system and immune system with *Neuromodulators*, chemical messengers of the nervous system, being released by nerves to guide immune function. The immune system communicates what's happening back to the nervous system by white blood cells' secreting chemical messengers called *cytokines*, a type of *neuropeptide* -- which are chemicals released by cells to communicate with the nervous system.

When the immune system is activated, immune cells also send out an array of specific chemicals, called *immunomodulators*, to influence the function of the nervous system. These *immunomodulators* reach specific target areas in the brain, where they start various recuperative (rebuilding) and protective behaviors such as shivering, sleepiness and an increased propensity to fight attackers.

This is why when people take a couple of aspirin or acetaminophen for pain and fever they may end up battling the sickness even longer because they are stopping these productive processes so they can feel better. Studies suggest that anti-fever therapy prolongs illness by stopping the body from inducing its natural defenses. These chemical pathways of communication are only a few of the



## Immune System as Sensory Organ

The immune system acts as a sensory organ, like the eyes or ears, only its spread out over the whole body and transmits information to the nervous system that is just as crucial in guiding a person's actions but much less distinct than sight or hearing. The immune system acts as a network of specialized biosensors designed to pick up information from within and around the body and relay that information to the brain. This causes animals or people to behave in specific ways to promote healing or to guide reactions in the interest of self-preservation. The activation of these functions can be altered by stress.

many routes of communication that the nervous system and the immune system use to keep us healthy.

### *Channels of Communication*

There are many channels of communication between the brain and the immune system. Numerous scientific and medical studies have demonstrated direct nerve supply to the immune system. It has been shown that there is direct contact between nerves and lymphocytes (immune cells that kill viruses and tumor cells) in the spleen and thymus gland (the gland that develops and programs immune cells to attack foreign objects). Obstruction of nerve activity to the spleen has been found to diminish immune responses including the ability of *natural killer cells* to target and destroy viruses and cancer cells.

As far back as 1945 it was demonstrated that the bone marrow itself has an extensive nerve supply. The nerve supply to the bone marrow is a direct link from the nervous system to white blood cells and the immature (new and growing) cells that will eventually become red blood cells and white blood



cells. Nerve stimulation to the bone marrow causes an activation of the immune response by releasing the immune cells into the general circulation. Since all the blood cells in our bodies are produced by the bone marrow this is a *really* important function.

You have no doubt heard about lymph nodes and probably know that when they are swollen it could mean you are sick. Lymph nodes are part of the *lymphatic system* which also plays a major role in immunity. All lymphoid organs including lymph nodes, spleen, etc., have a *direct* nerve supply for the purpose of controlling the immune response. Obstructions of the nervous system have been shown to alter the immune response and the function of these immune cells, specifically white blood cells (lymphocytes). The movement of lymphocytes to an area of the body where they are needed is controlled by the nervous system. Due to the heavy nerve supply of the thymus gland, the nervous system is thought to play a major role in the development of immune cells.

Obstruction of the nervous system can not only slow down the immune process but it can also result in overreactions or hypersensitivities - such as allergies for example. Allergies are an inappropriate immune response to a substance that is not actually harmful to the body. The nervous system causes immune responses to be fast and localized, getting lymphocytes and other immune blood cells to

spring into action. These cells kill bacteria, viruses, parasitic worms, produce antibodies, destroy cancer cells, release chemicals to attract more immune cells and alert the nervous system that there is something wrong, and they stop allergic reactions.

White blood cells lessen the severity of allergies by destroying substances that are harmful or perceived to be harmful by the body. These cells also stop the immune response when it is no longer needed.

### ***The Role of the Chiropractic Adjustment***

Obstruction of the nervous system can cause immune system dysfunction and the science of chiropractic says that by removing the nervous system obstruction spinal adjustments can help correct immune system dysfunction. Structural

### **What Causes Vertebral Subluxations?**

Vertebral subluxations are caused by an overload of either a physical, emotional or chemical stress and the body cannot *adapt* to it. When these types of stress exceed the limits of the body's ability to *adapt* a cascade is initiated which leads to subluxation. Subluxations cause obstruction in the nervous system by initiating this sequence of events:

1. Misalignment and/or abnormal motion of the vertebrae
2. Narrowing of the holes between the spinal vertebra where the nerves exit and/or irritation of nerves from the misalignment or abnormal movement
3. Obstruction of the nerves
4. A resulting interference to the flow of mental impulses
5. Spinal adjustments remove the obstruction, correct the subluxation and eliminate these adverse effects.

shifts and poor movement in the spine can adversely affect the immune response by causing the body to incorrectly activate a stress response, which slows the ability of the immune system to react.

Subluxations are obstructions in the nervous system caused by structural shifts in the spinal vertebra which can cause increased or decreased activity of the nervous system. An obstruction in the nervous system can affect the body in two different ways. One reaction the nervous system can have is to become *hyperactive*--the nervous system may bombard the body with excessive chemical messages that cause abnormal changes in growth and activity. When the nervous system is hyperactive over long periods of time it will tend to produce the development of abnormal conditions and disease

processes in the organs or tissues to which it supplies information.

A second way that a disturbance in the nervous system can affect the body occurs when the nervous system becomes *hypoactive*; cells that are normally controlled and suppressed begin working out of control, which in some cases are hypothesized to lead to cancer. All cells are equipped with all the necessary genes to allow them to reproduce, and with proper nervous system function only the appropriate set of genes are activated.

Cancer cells are cells that are growing and functioning out of control because the wrong set of genes has been turned and left on because the nervous system has failed to suppress them. Long term obstruction in the nervous system has also





been shown to be a factor in many disorders including autoimmune diseases, cancer, fibromyalgia and chronic fatigue syndrome.

The contention is that when the obstruction to the nervous system is corrected and the abnormal activities are eliminated, balance in the body can be re-established and the process of disease may be eliminated. An abnormally functioning nerve which is either *hyperactive* or *hypoactive* tends to return to normal function once the obstruction is removed.

However, it is crucial that corrections (adjustments) are given at a frequent interval in order for the normalization to take hold to cause a permanent correction.

#### ***Proactive Care Versus Reactive Health Care***

Unfortunately the way in which many people care for themselves is reactive. They will wait until a health problem arises before taking any actions to improve their health. Many health issues could be avoided if people took a more proactive stance on health decisions and started to take care of themselves or their children earlier in life. Children raised under chiropractic care have been shown to be less prone to infectious processes such as otitis media (ear infections) and tonsillitis, for example. These children have stronger immune systems and are also better able to cope with allergens such as pollen, weeds, grasses, etc. as compared to children not raised under chiropractic care. There is also a significant decrease in antibiotic therapy use among children receiving chiropractic care.

A Penn State University study of 654 Americans published in the *Journal of Social Science and Medicine* stated that persons with childhood health problems were twice as likely to develop cancer or chronic lung disease by late middle age. Arthritis was about 33% higher in this group. A childhood of

ill health may be the start of a full gamut of adult illnesses.

Chiropractic science says that chiropractic care removes obstructions to the nervous system which allows the immune system to combat infectious processes and not only helps sick people get well but helps healthy people become much healthier.

#### ***Conclusion***

The nervous system and the immune system have so many connections that they could correctly be referred to as a *single system*. The nervous system senses damage, infectious agents and foreign bodies with the help of chemical releasing immune cells and deals with these problems by deploying different types of immune cells to carry out specific procedures. Obstructions in the nervous system (subluxations) diminish the ability of an individual to sense and repair damage and combat infection, cancer etc. directly, resulting in diminished health. Research continues to accumulate which supports the relationship between vertebral subluxation, chiropractic adjustments and improved nervous and immune system function.



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