Spinal misalignments can cause a lot more than back pain.

Have you ever wondered why someone just suddenly develops low back pain? Why they just move the wrong way, cough, sneeze, or bend over and they are suddenly incapacitated with pain? There are many "causes" of low back pain but they usually have one thing in common. Improper joint motion, or what chiropractors call subluxation.

For almost 100 years subluxations were commonly thought to be simply "bones out of place." While the subluxated bones can be considered to be "out of place" and fixated or stuck, this only tells part of the story. What is actually occurring, and is the underlying cause of ongoing or recurring back pain, are changes in the nervous system that occur as a result of these subluxations.

Until late in the 1990's it was widely held that tissue in the central nervous system, the brain and spinal cord, could not heal. However, since early this century neuroscientists have come to realize that the brain is highly "plastic." This is referred to as neuroplasticity and means that the brain has a lifelong ability to reorganize its neural pathways as a result of new experiences. This is due in no small part to the presence of adult stem cells in the tissue, which were previously unrecognized as such and were recognized as glial cells – a type of support cell in the nervous system.

As a consequence of repetitive activities, such as improper posture, poor work positioning, repeated improper lifting, a bad bed, and numerous other causes, new patterns of movement are learned and become the new normal for your body. In other words, your body learns to move improperly as a consequence of these postural stressors. This is especially significant when it involves the spine.

When the spine moves improperly, specific segments of the spinal column called vertebrae move insufficiently and are considered "fixated." These fixated segments are at the core of the subluxation complex. When fixated, the neurological signals from these spinal joints change and this can have an adverse effect not only on the spine and the back, but also on brain activity; more about that later.

When subluxated or fixated there is a decrease in the neural input of neural receptors that provide information on joint position, and respond to pressure changes or distortions. They are referred to as mechanoreceptors. There has been research that demonstrates that the input from these mechanoreceptors effects various parts of the brain including, the cerebral cortex and the balance and coordination centers of the brain. This is important because the proper functioning of the nervous system is dependent on the input of mechanoreceptors from the muscles and joints of the body.

When there is a decrease in mechanoreceptor input, the nervous system becomes stressed and neurons begin firing in a more disorganized manner. This, in turn, causes a change in neural activity in the brain resulting in atypical brain wave patterns. This is referred to as the Neurological Dysregulation Syndrome.

At the same time, when there is joint fixation, there is also an increase in the neural input of nerve receptors that sense noxious or painful stimuli, called nociceptors. When the input from nociceptors increases the part of the brain called the hypothalamus releases ACTH, a hormone that causes the adrenal cortex to release cortisol, the primary stress chemical of the body.

There has been research that showed that when exposed to cortisol for a sustained period the areas of the brain responsible for memory, mood, and the interpretation of space, called the hippocampus, as well as the prefrontal cortex - the part of the brain responsible for orchestrating emotion, arousal, impulsivity, and attention - can be seriously damaged.

Neuroscience researcher Ned Kalin, MD of Jefferson Memorial Hospital stated "If key parts of the brain, or the entire brain, area weakened by stress chemicals, it could have major effects on the rest of the body. A common denominator in everything from chronic pain to immune dysfunction to heart disease and depression may be in the brain. It seems that when stress damages the brain, it is analogous to lines of code in computer software – neither the body nor the mind will operate correctly until the damage is fixed."

Neurological dysregulation is caused by several factors including subluxation, poor nutrition, trauma, drugs or toxins, and emotional and physical stress.

Some of the conditions resulting from or worsened by neurological dysregulation include ADD/ADHD, headaches including migraines, memory loss, fibromyalgia, chronic fatigue syndrome, chronic pain, and weight gain to name a few.

Due to the neuroplasticity changes in the nervous system can result in a wide array of symptoms and disorders ranging form learning disorders to chronic pain. One example of this is the chronic pain that occurs after a chronic mental stress and the relationship between chronic pain and emotional stress. A type of nerve fiber that usually transmits temperature and some pain to the brain, called "C fibers," can begin to produce and release pain chemicals when your body is under mental or physical stresses. This condition is called neurogenic inflammation and is a cause of many of the chronic back pain patients seen by chiropractors.

Spinal subluxations can thus cause or aggravate many conditions you may not associate with the spine. It is for this reason that generations of chiropractors have had success treating a wide array of conditions that you might not initially think of using manipulation for. Conditions such as mild hypertension, ADD/ADHD, bed wetting, migraine headache, and indigestion are just a few of the conditions that may benefit from spinal manipulation.

Rebalancing the nervous system is how manipulation works. Just as neuroscientists once believed nervous system couldn't heal and have seen their understanding of how the nervous system works change and evolve, so too have practitioners of manipulation experienced a sea change in our understanding of the effects spinal manipulation has on

the nervous system and an explanation for all the seemingly miraculous events that have occurred because of manipulation in the past.

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