

A Biomechanical Approach

Written by Charles W Chapple, DC, FICPA

Sunday, 01 March 2009 00:00 - Last Updated Friday, 10 January 2014 11:25

So frequently are behavioral and developmental disorders addressed through a variety of behavioral and chemical approaches that the significance of the biomechanical aspects of these conditions can be underestimated. This article introduces the importance of the nervous system with its biomechanical relationships to the spine and cranium, and the noninvasive approaches of chiropractic and craniosacral therapy for the benefit of sensory, motor, and neurological function in individuals with ASD, PDD, and SPD.

As a parent of a toddler with ASD, PDD, and SPD diagnoses, I sympathize with other parents' drive to identify a cause and a solution. As a chiropractor with 14 years of experience and a fellowship in chiropractic pediatrics, and in pursuit of my certification in craniosacral therapy, I am additionally driven to identify a course of action that improves the structure and function of individuals with sensory, motor, and neurological dysfunction with these diagnoses. In individuals with these special needs, an approach that naturally improves the bodies' structure or biomechanics is an essential component to their functional, educational, behavioral, and emotional development, as well as to their quality of life.



CHIROPRACTIC FOR LIFE

a BIOMECHANICAL approach

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TO IMPROVE BEHAVIORAL AND DEVELOPMENTAL DISORDERS

So frequently are behavioral and developmental disorders addressed through a variety of behavioral and chemical approaches that the significance of the biomechanical aspects of these conditions can be underestimated. This article introduces the importance of the nervous system with its biomechanical relationships to the spine and cranium, and the noninvasive approaches of chiropractic and craniosacral therapy for the benefit of sensory, motor, and neurological function in individuals with ASD, PDD, and SPD.

As a parent of a toddler with ASD, PDD, and SPD diagnoses, I sympathize with other parents' drive to identify a cause and a solution. As a chiropractor with 14 years of experience and a fellowship in chiropractic pediatrics, and in pursuit of my certification in craniosacral therapy, I am additionally driven to identify a course of action that improves the structure and function of individuals with sensory,

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motor, and neurological dysfunction with these diagnoses. In individuals with these special needs, an approach that naturally improves the bodies' structure or biomechanics is an essential component to their functional, educational, behavioral, and emotional development, as well as to their quality of life.

I have become aware of the many nuances and joys of viewing life through the eyes of a special-needs child. This experience has challenged me to further study and appreciate the significance of the body's most important organ system, the central nervous system.

According to Sharon Basmajian, M.D., author of *Health, Research and Beyond Action* and mother of a son on the autistic spectrum, even the DSM-IV (the manual for diagnosis of individuals with ASD) acknowledges sensory language, social, and behavioral variations, yet it minimizes sensory involvement. Recognizing the significance of sensory involvement with individuals with ASD, PDD, and SPD diagnoses is the essence of realizing the significance of the nervous system.

The central nervous system is comprised of the brain and brain stem, the spinal cord, and the nerve attachments, which communicate with the body's cells, tissues, muscles, and organs. Within just 18 days of conception, it is the first body system to develop. It strives to encompass a communication network of more than 40 miles of nerves, which send vital messages between the brain and body at rate of 325 mph. Within a 24-hour time frame, the communication of this system is responsible for more than 10,000 heartbeats, 2,000 gallons of blood pumped, and more than 25,000 breaths, thus moving about 7 million brain cells.

The nervous system's importance to the body is highlighted by the fact that it is housed in protective bone—the brain by the skull and the spinal cord by the spinal column.

Furthermore, fluid flow, affected by the relationship between the sutures of the bony skull and the sacrum, as well as receptor input at the joints of the bony spinal column influence nervous system input. Therefore, improper biomechanics or body/body mechanics can negatively impact the body's nervous system

reception affecting the body sense of position (proprioception), motion, balance, muscle tone, coordination, motor planning, and auditory language processing (vestibular sense) and touch perception (tactile sense)—essential for academic learning, emotional security, and social skills. Even further-reaching are the effects of poor mechanics on pain perception (nociception), as well as on many other body functions through the specialized communication of the autonomic system of the nervous system. The 12 cranial nerves located at the brain stem are additionally significant to the body's effective and appropriate sense of smell, sight, taste, and hearing. This central nervous system and its intimately related bony protection system are a profound link between a person's external and internal environments, especially one with special needs. This link is critical in enabling a person to interact with his or her surroundings and with others.

Healthcare practitioners are challenged to quantify variations of this vital communication with individuals diagnosed with ASD, PDD, and SPD. In fact, conventional testing of aerology, such as an MRI, EEG, and varied genetic blood markers, may commonly appear unremarkable. However, in an effort to see the layer beyond the form, or to identify improvements to be made in the function of the nervous system beyond a diagnosis, sensitive analysis for the nerve system stress (relaxation) performed by a doctor of chiropractic can yield productive information relevant to the care of these children. This author utilizes Infrared Thermography (IT) and/or Surface Electromyography (sEMG), as well as Digital Foot Scans as adjunct and illustrative tools for such analysis following a history, consultation, and examination.

Infrared Thermography measures the imbalances in temperature along the spine. Whenever communication between the central nervous system and blood results in malfunctioning due to imbalances, definable differences in temperature are detected and identified by abnormal color patterns. Similar imbalances exist within the autonomic nervous system, which adversely affects organs and glands. Surface electromyography measures

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According to Sharon Rosenbloom, SLP, author of *Souls, Beneath and Beyond Autism* and mother of a son on the autistic spectrum, even the DMSR (the manual for diagnosis of individuals with ASD) acknowledges mainly language, social, and behavioral variations, yet it minimizes sensory involvement. Recognizing the significance of sensory involvement with individuals with ASD, PDD, and SPD diagnoses is the essence of realizing the significance of the nervous system.

The central nervous system is comprised of the brain and brain stem, the spinal cord, and the nerve attachments, which communicate with the body's cells, tissues, muscles, and organs. Within just 18 days of conception, it is the first body system to develop. It evolves to encompass a communication network of more than 45 miles of nerves, which sends vital messages between the brain and body at rate of 325 mph. Within a 24-hour time frame, the communication of this system is responsible for more than 103,000 heart beats, 2,100 gallons of blood pumped, and more than 23,000 breaths, thus exercising about 7 million brain cells.

The nervous system's importance to the body is highlighted by the fact that it is incased in protective bone—the brain by the skull and the spinal cord by the spinal column.

Furthermore, fluid flow, affected by the relationship between the sutures of the boney skull and the sacrum, as well as receptor input at the joints of the boney spinal column influence nervous system input. Therefore, improper biomechanics or body/boney mechanics can negatively impact the body's nervous system reception affecting the body sense of position (proprioception); motion, balance, muscle tone, coordination, motor planning, and auditory-language processing (vestibular sense); and touch perception (tactile sense) essential for academic learning, emotional security, and social skills. Even further-reaching are the effects of poor mechanics on pain perception (nociception), as well as on many other body functions through the specialized communication of the autonomic portion of the nervous system. The 12 cranial nerves located at the brain stem are additionally significant to the body's effective and

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Healthcare practitioners are challenged to quantify variations of this vital communication with individuals diagnosed with ASD, PDD, and SPD. In fact, conventional testing of neurology, such as an MRI, EEG, and varied genetic blood markers, may commonly appear unremarkable. However, in an effort to see the forest beyond the trees, or to identify improvements to be made in the function of the nervous system beyond a diagnosis, noninvasive analysis for nerve system stress (subluxations) performed by a doctor of chiropractic can yield productive information relevant to the care of these children. This author utilizes Infrared Thermography (IT) and/or Surface Electromyography (sEMG), as well as Digital Foot Scans as adjunct and illustrative tools for such analysis following a history, consultation, and examination.

Infrared Thermography measures the imbalances in temperature along the spine. Whenever communication between the central nervous system and blood vessels is malfunctioning due to subluxations, definable differences in temperature are detected and identified by abnormal color patterns. Similar imbalances exist within the autonomic nervous system, which adversely affects organs and glands. Surface electromyography measures the effectiveness of motor nerves by measuring the amount of current located in the muscles. Subluxations disturb the operation of the motor nerve and thus are identified by abnormal color patterns produced by the sEMG. A digital foot scan is another noninvasive tool which further enables the doctor of chiropractic to evaluate individuals with altered gait and stance mechanics, such as toe-walking.

Chiropractors identify the need for, and utilize, gentle pressure techniques, called adjustments, in order to remove subluxations. Subluxations are characterized by 1) irregular boney mechanics or spinal effects of poor mechanics on pain misalignments, 2) nerve imbalances, perception (nociception), 3) muscle irritation, 4) tissue inflammation, and 5) degenerative wear.

The poor structure involved in a subluxation results in poor motor, sensory, and neurological function. An individual with subluxations may experience multiple health concerns ranging from, but not limited to, pain, asthma, bedwetting, digestive upset, neurological disorganization, attention deficit/hyperactivity, scoliosis, and spinal degeneration.

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To an individual with ASD, PDD, and SPD, subluxations could additionally manifest in numerous forms, possibly accentuating a hyposensitivity or hypersensitivity. Hyposensitivity is a symptom of a less active sensory portion of the nervous system; in essence, the volume to sensation is too low. Commonly, motor and other neurological functions are also hypoactive. Conversely, hypersensitivity is a symptom of an overactive sensory portion of the nervous system; the volume is too high. A principle indication of hyposensitivity is the craving for pressure, and a principle indication of hypersensitivity is the avoidance of pressure or touch. (Hypersensitive individuals can present their own set of challenges when utilizing a hands-on treatment, such as chiropractic or CST. Frequently, parents and siblings help in defining a comfort zone for the hypersensitive individual.)

A chiropractic adjustment restores more appropriate sensory, motor, and neurological input at the receptors of joints. Therefore, with either a hyposensitive or hypersensitive individual, one purpose of an adjustment is to turn up or down the volume of sensory input. It would then be reasonable for a parent or caregiver to note subjective gains, such as reduced sensory or motor stimulation, and for a chiropractor to document biomechanical improvements through re-examination or Thermography and sEMG.

CST focuses on relieving undue pressure on the brain and spinal cord through light manual pressure at the cranium (skull) and sacrum (base of the spine). This craniosacral system is made up of the membranes and the cerebral spinal fluid, which serves to protect the central nervous system. Manually monitoring its rhythm detects restrictions in this hydrostatic fluid system. As irregularities in cardiovascular and respiratory rhythm could indicate numerous health concerns, so, too, variations in the craniosacral rhythm could indicate any number of motor, sensory, or neurological impairments. A few examples of such conditions are migraines, chronic pain, fatigue, and learning disabilities. Similarly, following a course of CST treatment, both subjective and objective references would be monitored for expected improvements. CST practitioners are commonly massage therapists, chiropractors, osteopaths, and physical and occupational therapists. These healthcare providers also may pursue additional training in related techniques, including lymphatic drainage.

Ultimately, a biomechanical approach to improve sensory, motor, and neurological function for these special-needs individuals can benefit from bioenergetic, biochemical/ nutritional, and bioemotional components. Within this complementary approach, which would ideally involve many separate healthcare practitioners and healthcare approaches, a person's total health can be addressed. Furthermore, although chiropractic treatment and CST, either separately or shared, are not meant to be a cure for individuals with ASD, PDD, and SPD, functional, behavioral, emotional, and educational gains are legitimate goals whenever structure is improved and function follows.

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This article appeared in [Pathways to Family Wellness](#) magazine, Issue #21.

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