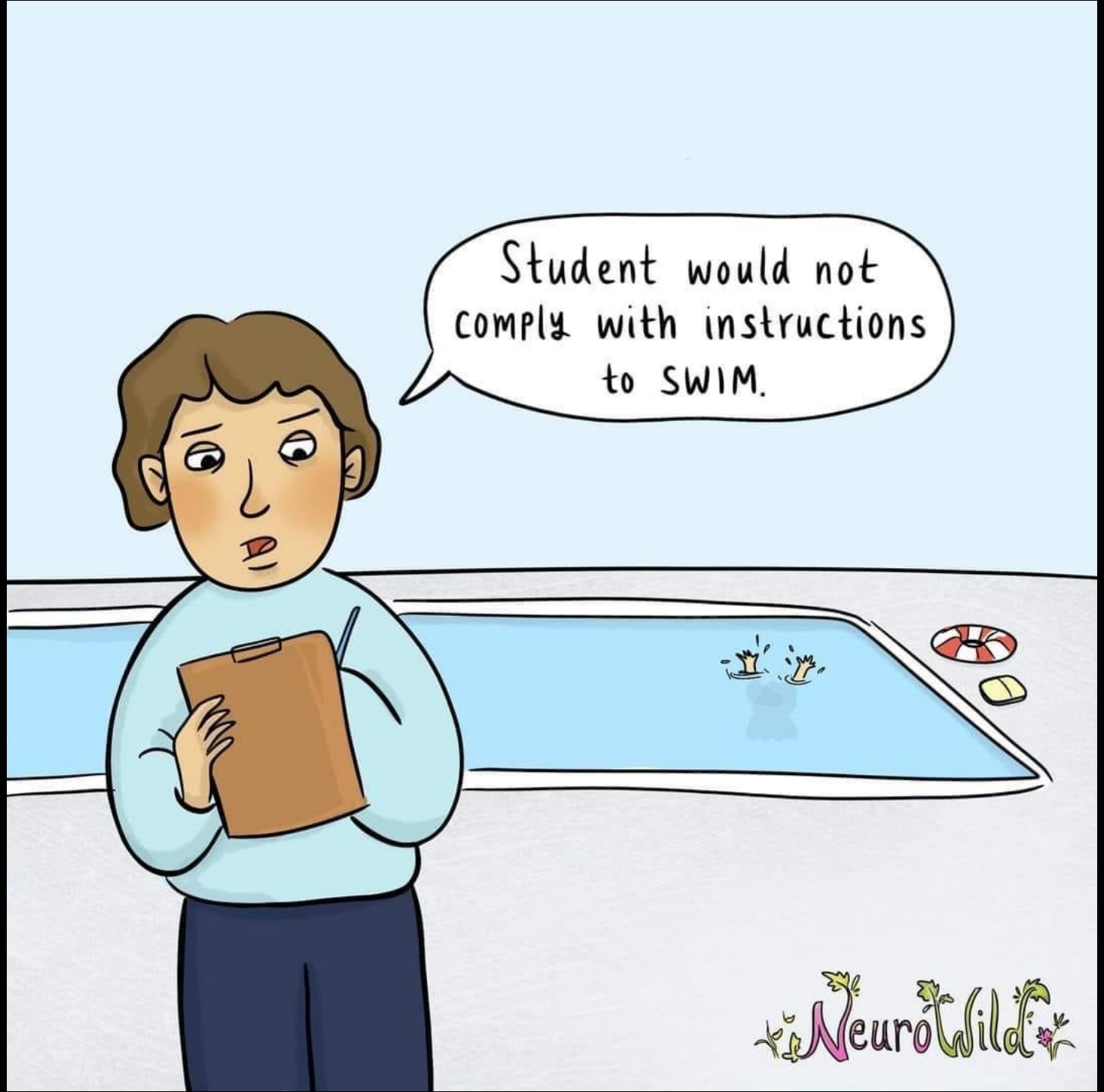


The Role of Chiropractic in Neurobehavioral & Related Challenges

Georgia Council on Chiropractic
Atlanta, June 23, 2024

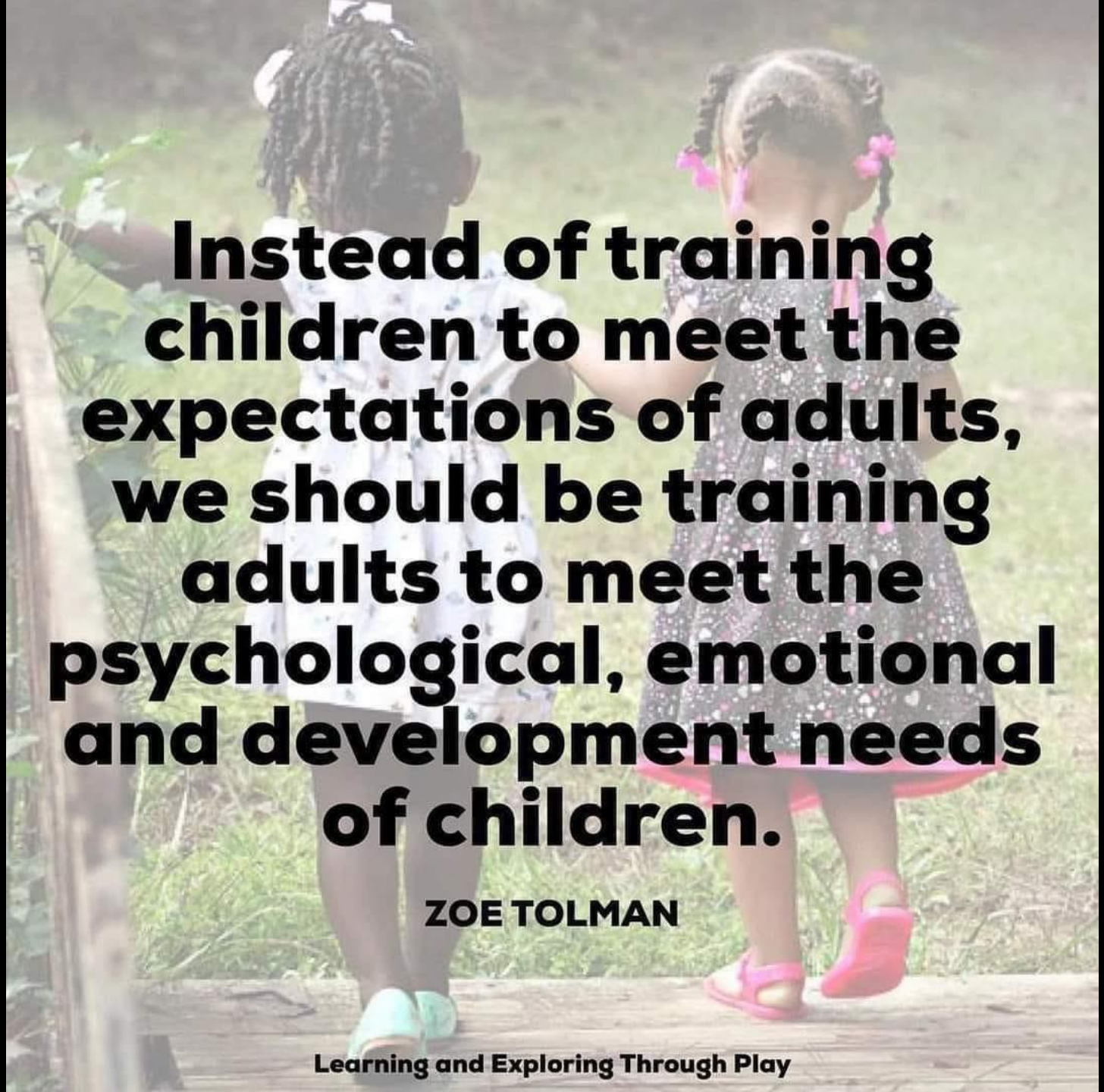
Matthew McCoy DC, MPH
Free Human Being
Publisher – McCoy Press
CEO - ChiroFutures Malpractice Insurance Program
Vice President – Foundation for Vertebral Subluxation

ChiroFutures
Malpractice Insurance Program
www.chirofutures.org


Student would not comply with instructions to SWIM.
NeuroWild



OUTNUMBERED?

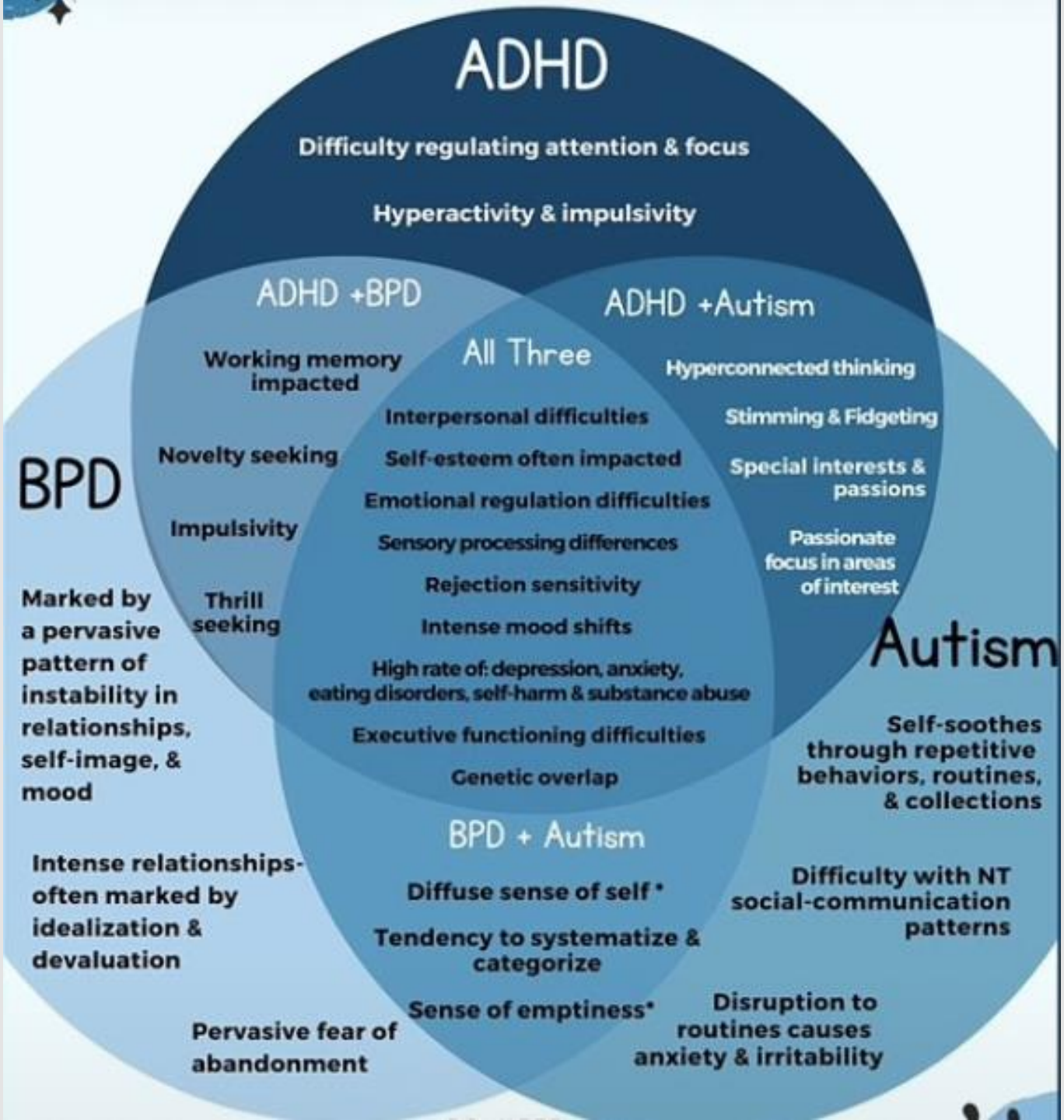

Instead of training children to meet the expectations of adults, we should be training adults to meet the psychological, emotional and development needs of children.
ZOE TOLMAN
Learning and Exploring Through Play

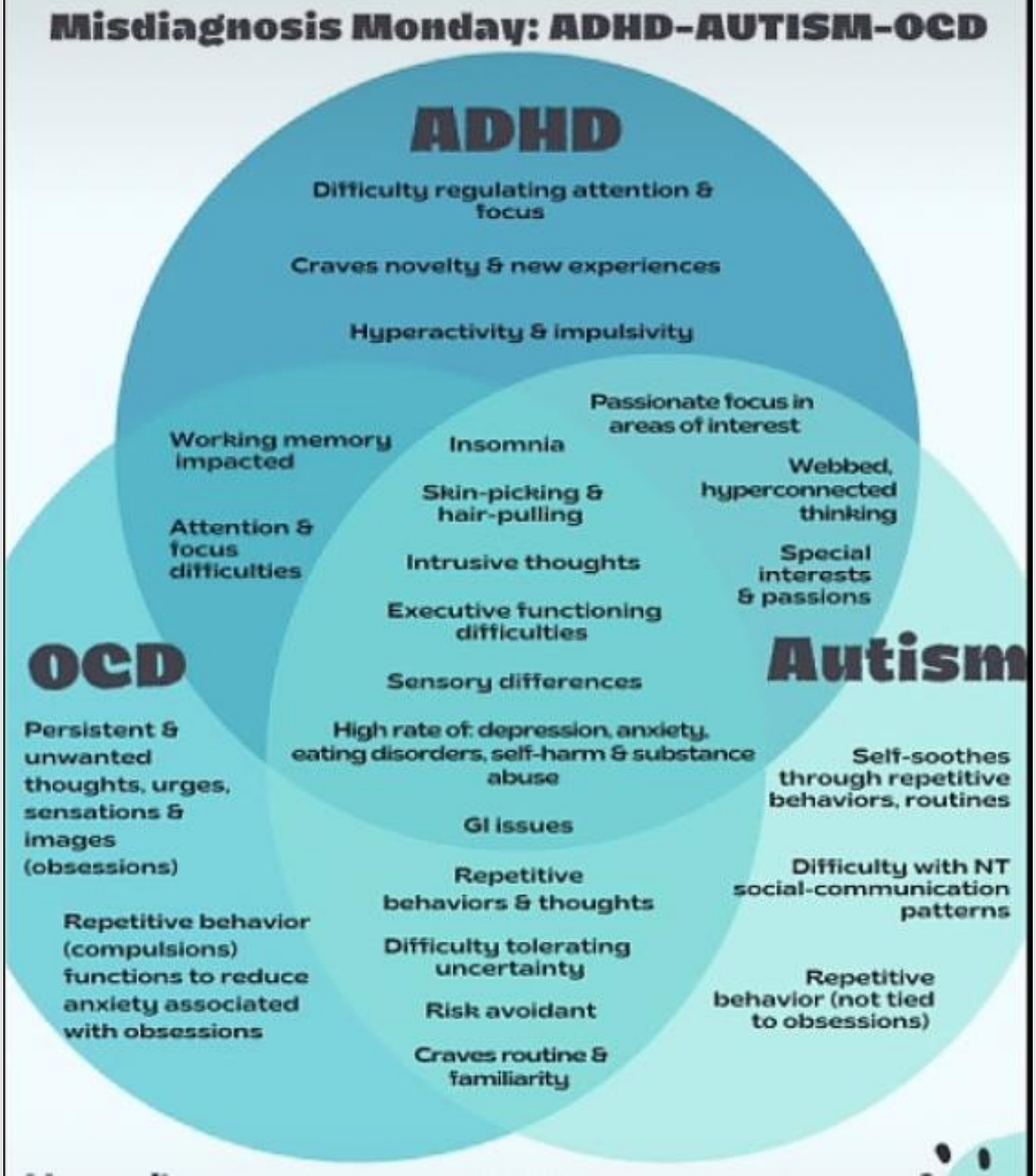
Neurotypical

Neurotypical is defined as an individual with normal brain development and functioning.

Neurobehavorial
Neurodevelopmental
Neurodivergent
Neurodeflective

Disorders, Challenges, etc.


ADHD
Difficulty regulating attention & focus
Hyperactivity & impulsivity
ADHD +BPD
Working memory impacted
Novelty seeking
Impulsivity
Thrill seeking
ADHD +Autism
Hyperconnected thinking
Stimming & Fidgeting
Special interests & passions
Passionate focus in areas of interest
All Three
Interpersonal difficulties
Self-esteem often impacted
Emotional regulation difficulties
Sensory processing differences
Rejection sensitivity
Intense mood shifts
High rate of: depression, anxiety, eating disorders, self-harm & substance abuse
Executive functioning difficulties
Genetic overlap
BPD
Marked by a pervasive pattern of instability in relationships, self-image, & mood
Autism
Self-soothes through repetitive behaviors, routines, & collections
BPD + Autism
Intense relationships- often marked by idealization & devaluation
Diffuse sense of self *
Tendency to systematize & categorize
Sense of emptiness*
Difficulty with NT social-communication patterns
Pervasive fear of abandonment
Disruption to routines causes anxiety & irritability


Misdiagnosis Monday: ADHD-AUTISM-OCD
ADHD
Difficulty regulating attention & focus
Craves novelty & new experiences
Hyperactivity & impulsivity
Working memory impacted
Attention & focus difficulties
Insomnia
Skin-picking & hair-pulling
Intrusive thoughts
Executive functioning difficulties
Sensory differences
High rate of: depression, anxiety, eating disorders, self-harm & substance abuse
GI issues
Repetitive behaviors & thoughts
Difficulty tolerating uncertainty
Risk avoidant
Craves routine & familiarity
Passionate focus in areas of interest
Webbed, hyperconnected thinking
Special interests & passions
OCD
Persistent & unwanted thoughts, urges, sensations & images (obsessions)
Repetitive behavior (compulsions) functions to reduce anxiety associated with obsessions
Autism
Self-soothes through repetitive behaviors, routines
Difficulty with NT social-communication patterns
Repetitive behavior (not tied to obsessions)

Highly Sensitive Child
compared to
Autistic Child

Highly Sensitive Child

High Empathy:
Highly empathetic and responsive to other's needs*

Aesthetic Appreciation:
heightened appreciation for art, music, and natural beauty*

Heightened Emotional Awareness: Highly aware of and responsive to the emotions and moods of others*

Violence Sensitivity: Deeply impacted by images and stories of violence*

Overlap

Sensory sensitivities

Value-driven

Deeply impacted by emotional tone

Deep processing style

Cognitively overloaded by too many tasks

Need lots of sensory down time

Sensitive nervous systems

Slow to warm up to change and new contexts

Anxiety when adjusting to new contexts

Big emotions: Both tend to have heightened emotions

Autistic Child

Allistic Social Cues:
Does not subcortically pick up allistic social cues**

Special Interests and Repetition:
Self-soothe with interests, repetitive movement (stimming), and routine

Bottom-Up Processing:
Analyzes details first, then forms a complete understanding

Structured Arrangement:
Strong preference for organizing objects or information in structured and ordered ways

Context Independent:
The brain does not subcortically pick up context cues and values authenticity across various contexts**

Distinct Communication Style
(direct, literal, authentic)


NEURODIVERSITY
Autistic Spectrum Disorder
Dyslexia
Trauma
Developmental Disabilities
Cultural Diversity
ODD
Specific Learning Difficulties
ADHD
Anxiety
OCD
Auditory Processing
Sensory Integration Disorder
Gifted
Developmental Co-ordination Disorder
ADD
Tourette's

CASE STUDY

Upper Cervical Chiropractic Care for a Sixteen-Year-Old Male with Bipolar Disorder, Attention Deficit Hyperactivity Disorder and Vertebral Subluxation

Matthew T. Wolfertz, D.C. & Valerie L. Dahlberg, D.C.

ABSTRACT

Objective: To review the upper cervical chiropractic care of a sixteen-year-old diagnosed with Bipolar Disorder (BD) and Attention Deficit Hyperactivity Disorder (ADHD).

Clinical Features: A sixteen-year-old boy suffered with symptoms of Bipolar Disorder and Attention Deficit Hyperactivity Disorder since six months of age. His mother reported that he was born with the umbilical cord around his neck and forceps were used to assist delivery. The child experienced frequent accidents and medications included antipsychotics, as well as slow release stimulants for ADHD and depression.

Intervention & Outcome: Upon examination, a subluxation was found in the upper cervical region of the spine using thermography and radiographic analysis. Knee Chest Upper Cervical Specific protocol was used to correct the cervical subluxation. The patient's condition was evaluated by the doctor's observation, his mother's subjective descriptions of the symptoms, and thermographic scans. After seven weeks of care the patient's symptoms were eliminated or greatly diminished. He no longer required any medications.

Conclusion: Successful chiropractic care is described in the case of a sixteen-year-old diagnosed with Bipolar Disorder (BD) and Attention Deficit Hyperactivity Disorder (ADHD). More research is warranted on the upper cervical subluxation contributing to BD and ADHD.

Key Terms: *upper cervical, chiropractic, Attention Deficit Hyperactivity Disorder, Bipolar, subluxation, thermography, Knee Chest*

Introduction

ADHD affects 3% to 7% of school-aged children and has been associated with a variety of co-morbid mental illnesses and functional impairments.[1] There are three main symptoms of ADHD that include impulsiveness, inattention, and hyperactivity.[2] Bipolar Disorder is a psychiatric disorder with symptoms of recurrent mood episodes and has a high rate of suicide.[3] Both ADHD and BD are prevalent disorders and it is important to research the effect alternative care choices have on these conditions.

There is limited information available on the possible relationship between the upper cervical subluxation and BD ADHD. A case report of a nine-year-old male with Tourette Syndrome, ADHD, depression, asthma, insomnia and headaches demonstrated that upper cervical chiropractic care

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Fetal Alcohol Spectrum Disorders

FAS --the most severe diagnosis on the spectrum of alcohol related disorders

FASD --Fetal Alcohol Spectrum Disorder

- ARBD (alcohol related birth defects)
- ARND (alcohol related neuro-developmental disorder)
- FAE (fetal alcohol effects)
- FAS (fetal alcohol syndrome)

brain sciences

MDPI

Review

Autism Spectrum Disorder and Fetal Alcohol Spectrum Disorder: A Literature Review

Barbara Carpita *, Lavinia Migli, Ilaria Chiarantini, Simone Battaglini, Clara Montalbano, Claudia Carmassi, Ivan Mirko Cremone and Liliana Dell'Osso

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Abstract: Fetal alcohol spectrum disorders (FASD) are a group of conditions associated with the effects of prenatal alcohol exposure and characterized by somatic and neuropsychological alterations. On the other hand, autism spectrum disorder (ASD) is characterized by a multifaceted neurobehavioral syndrome. Since alcohol can affect every stage of brain development, some authors hypothesized that in utero alcohol exposure might be linked to an increased risk of ASD in subjects with genetic vulnerability. The present review aimed to summarize the available literature on the possible association between FASD and ASD, also focusing on the reported clinical overlaps and on the possible shared pathogenic mechanisms. Studies in this field have stressed similarities and differences between the two conditions, leading to controversial results. The available literature also highlighted that both the disorders are often misdiagnosed or underdiagnosed, stressing the need to broaden the perspective, paying specific attention to milder presentations and sub-syndromic traits.

Keywords: autism; autistic traits; fetal alcohol spectrum disorder; fetal alcohol syndrome; neurodevelopmental disorder

check for updates

Citation: Carpita, B.; Migli, L.; Chiarantini, I.; Battaglini, S.; Montalbano, C.; Carmassi, C.; Cremone, I.M.; Dell'Osso, L. Autism Spectrum Disorder and Fetal Alcohol Spectrum Disorder: A Literature Review. Brain Sci. 2022, 12, 792. https://doi.org/10.3390/brainsci12060792

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1. Introduction

Fetal alcohol spectrum disorders (FASD) are a group of conditions associated with the effects of prenatal alcohol exposure and characterized by several kinds of impairments: distinctive facial characteristics (palpebral fissures, a smooth philtrum, a thin upper vermillion border, maxillary hypoplasia), cardiac defects, and growth retardation. Knowledge about FASD is still in its infancy. FASD is a condition of recent definition and, in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), is still included among the conditions for which more research is needed [1]. In addition, the broad FASD category features conditions with different grades of severity. When fetal alcohol syndrome (FAS), the most severe form of FASD, was firstly identified, the newborns diagnosed with FAS shared some distinctive physical characteristics [2]. However, further studies progressively highlighted that alcohol-induced alterations may be expressed by a broader range of symptoms and traits than previously thought. In particular, FAS manifestations may vary depending on the dosages, the trimester of exposure, the mother's food intake and genetic factors. For example, not all the children with prenatal alcohol exposure show typical facial characteristics [2]. Noticeably, the most critical effects of in utero alcohol exposure were reported to be those on the fetal brain; alcohol may affect every single stage of brain development, from neurogenesis to myelination [2]. Initially, confirmed maternal alcohol consumption was not needed for the diagnosis of FAS. On the other hand, the term Partial FAS was used when the newborn had only some characteristics typical of the syndrome, but there was a confirmed anamnesis of maternal alcohol consumption. It should be noted that the term FASD could be considered an umbrella definition that includes different

Studies in this field have stressed similarities and differences between the two conditions, leading to controversial results. The available literature also highlighted that both the disorders are often misdiagnosed or underdiagnosed, stressing the need to broaden the perspective, paying specific attention to milder presentations and sub-syndromic traits.

Fetal Alcohol Spectrum Disorders

- Brain abnormalities via imaging techniques
- Memory problems
- Attachment disorder
- Impaired motor skills
- Learning disabilities
- Problems with reasoning and judgment
- Inability to discern consequences of actions
- Intellectual impairment
- ADHD/ADD
- Speech/Language Disorders
- Difficulties with feeding
- Tactile dysfunction/overly stimulated
- Cognitive or intellectual deficits
- Delayed development
- Impaired visual skills
- Neurosensory hearing loss
- Social skills
- Lack of stranger fear
- Naiveté and gullibility
- Immaturity
- Executive functioning deficits
- Reasoning, judgment, planning ahead
- For infants—poor suck, feeding difficulties
- Delayed motor milestones
- Difficulty writing or drawing
- Balance problems
- Poor dexterity
- Delays in feeding, motor delays
- Mental Health problems
- Inability to achieve independence
- Criminal activity

JOURNAL OF THE ROYAL SOCIETY OF MEDICINE Volume 89 July 1996

The D_2 dopamine receptor gene as a determinant of reward deficiency syndrome

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J G Cull PhD[6,7] D E Comings MD[7,8]

J R Soc Med 1996;**89**:396–400

SUMMARY

The dopaminergic system, and in particular the dopamine D_2 receptor, has been profoundly implicated in reward mechanisms in the brain. Dysfunction of the D_2 dopamine receptors leads to aberrant substance seeking behaviour (alcohol, drug, tobacco, and food) and other related behaviours (pathological gambling, Tourette's syndrome, and attention deficit hyperactivity disorder). We propose that variants of the D_2 dopamine receptor gene are important common genetic determinants of the 'reward deficiency syndrome'.

INTRODUCTION

After the finding by our laboratories of a strong association between the A_1 allele of the D_2 dopamine receptor gene and alcoholism[1], several groups were unable to replicate the observation[2–9]. We have suggested two possible reasons—first, inadequate screening of controls for alcohol, drug, and tobacco abuse; and, second, sampling errors in terms of characterization of alcoholics for chronicity and severity of the disease.

Here we review the evidence that the D_2 dopamine

A strong correlation between variants of the dopamine D_2 receptor gene and alcoholism and polysubstance abuse (including crack/cocaine) has been reported by several investigators[1,9,17–29].

In brain tissue obtained from patients carrying the A_1, B_1, and intron[6]-exon[7] haplotypes of the DRD_2 gene dopamine D_2 receptor densities are low[10,25,30]. Similarly, DRD_2 densities have been found lower in alcohol-preferring rodents than in alcohol-non-preferring animals[31–33]. Moreover, D_2 receptor agonists reduce, and D_2 receptor agonists

Reward Deficiency Syndromoe

High risk for multiple addictive, impulsive and compulsive behavioral propensities, such:

- Alcoholism, cocaine, heroin, marijuana and nicotine addiction
- Glucose bingeing,
- Pathological gambling,
- Sex addiction,
- ADHD,
- Tourette’s Syndrome,
- OCD
- Autism,
- Chronic violence,
- Post traumatic stress disorder,
- Schizoid/avoidant cluster,
- Conduct disorder and antisocial behavior.

CASE STUDY

Upper Cervical Chiropractic Care For A Nine-Year-Old Male With Tourette Syndrome, Attention Deficit Hyperactivity Disorder, Depression, Asthma, Insomnia, and Headaches: A Case Report

Erin L. Elster, D.C.

ABSTRACT

Objective: To review the effectiveness of chiropractic care using an upper cervical technique in the case of a nine-year-old male who presented with Tourette Syndrome (TS), Attention Deficit Hyperactivity Disorder (ADHD), depression, asthma, insomnia, and headaches.

Clinical Features: This nine-year-old boy suffered from asthma and upper respiratory infections since infancy; headaches since age 6; TS, ADHD, depression and insomnia since age 7; and neck pain since age 8. His mother reported the use of forceps during his delivery. His medications included Albuterol, Depakote, Wellbutrin, and Adderall.

Intervention: During the patient's initial examination, evidence of a subluxation stemming from the upper cervical spine was found through thermographic and radiographic diagnostics. Chiropractic care using an upper cervical technique was administered to correct and stabilize the patient's upper neck injury. Diagnostics and care were performed in accordance with the guidelines of the International Upper Cervical Chiropractic Association.

Outcome: Evaluation of the patient's condition occurred through doctor's observation, patient's and parents' subjective description of symptoms, and thermographic scans. After six weeks of care, all six conditions were no longer present and all medications were discontinued with the exception of a half-dose of Wellbutrin. At the conclusion of his case at five months, all symptoms remained absent.

Conclusion: The onset of symptoms soon after the boy's delivery; the immediate reduction in symptoms correlating with the initiation of care; and the complete absence of symptoms within six weeks of care; suggest a link between the patient's traumatic birth, the upper cervical subluxation, and his neurological conditions. Further investigation into upper cervical trauma as a contributing factor to Tourette Syndrome, ADHD, depression, insomnia, headaches, and asthma should be pursued.

Key Indexing Terms: *upper cervical spine, chiropractic, Tourette Syndrome, depression, asthma, Attention Deficit Hyperactivity Disorder, headaches, trauma, thermography*

INTRODUCTION

The following case report describes the symptoms of a nine-year-old male with Tourette Syndrome (TS), Attention Deficit Hyperactivity Disorder (ADHD), depression, asthma, insomnia, headaches, and neck pain; the intervention of upper cervical chiropractic care; and the patient's symptomatic response. Reports depicting the use of chiropractic care with patients with the aforementioned diagnoses are extremely limited. This paper serves to establish a foundation for future research.

B.J. Palmer, D.C., reported upper cervical chiropractic management of patients with headaches, asthma, insomnia, tics, and depression as early as 1934.[1] Palmer's chiropractic care included paraspinal thermal scanning using a neurocalometer (NCM), a cervical radiographic series to analyze upper cervical misalignment, and a specific upper cervical adjustment performed by hand. Positive results (symptoms were improved and/or eliminated) were achieved in hundreds of patients whose upper cervical subluxations were corrected.

General chiropractic (adjustments throughout a patient's spine) management of asthma, headaches, and ADHD has been reported only occasionally and has shown varied results.[2-5] In controlled studies using spinal manipulation therapy (SMT), results either were inconclusive or showed a slight percentage improvement in the SMT group compared to the control group.

Erin L. Elster, D.C., Private Practice, Boulder, CO 80303

CASE STUDY

Reduction of Motor and Vocal Tics in a Female Undergoing Chiropractic Care to Reduce Vertebral Subluxation

Pamela Stone-McCoy, B.S., D.C., CACCP [1] Kim Muhlenkamp, B.S., D.C.[2]

Abstract

Objective: To review the effectiveness of chiropractic care in the case of a 20 year old female presenting with Tourette Syndrome (TS) symptoms, headaches and vertebral subluxations.

Clinical Features: A 20 year old female began experiencing motor and vocal tics at the age of three. She has never taken medication for TS, but has tried to control it by taking magnesium and calcium supplements.

Interventions and Outcomes: Chiropractic care was administered after initial exam revealed disturbances to the nervous system resulting from vertebral subluxation. Subluxations were diagnosed based on findings from posture, static and motion palpation, thermography and static surface electromyography. The patient was seen 32 times over the course of one year. The patient experienced significant decreases in the occurrence and severity of her motor and vocal tic episodes as well as an improvement in headaches.

Conclusion: With consistent chiropractic care directed at reducing vertebral subluxation, the patient was able to better function throughout the day with decreased motor and vocal tic episodes. Further research on chiropractic, subluxation and neurodevelopmental disorders is needed.

Key Words: *Tourette Syndrome, Chiropractic, adjustment, motor tics, vocal tics, spinal manipulation, vertebral subluxation, thermography, surface electromyography*

Introduction

Tourette syndrome (TS) is a developmental disorder characterized by unwanted, irresistible, stereotyped movements and vocalizations called 'tics'. Symptoms frequently appear around the ages of 6-7 years old and peak in intensity during early adolescence.[1] Comorbid conditions of attention, impulse control, and mood are common - particularly Attention Deficit Hyperactivity Disorder (ADHD) and Obsessive-Compulsive Disorder (OCD).[2]

The DSM -IV diagnostic criteria for TS requires a diagnosis prior to 18 years of age, tics not due to substances or other disorders and the presence of motor tics and vocal tics for greater than one year.[1] TS is seen in all ethnic and racial groups with a strong 4:1 predisposition for males over females. The peak incidence is in early preadolescence with resolution of symptoms in adult life in 50% of cases.[3]

The exact cause of TS remains unknown. Its symptoms were first recorded in 1825 by Jean-Marc Gaspard Itard, Chief Physician at the National Institute for Deaf Mutes in Paris.[4]

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2. Memphis, TN

CASE STUDY

Chiropractic Care of an Adolescent Patient with Rumination & Vertebral Subluxation

Cristina Esposito, B.S., D.C.[1]

ABSTRACT

Objective: The chiropractic care of an adolescent patient previously diagnosed with rumination is described.

Clinical Features: A 14-year-old female reported with a chief complaint of right anteromedial knee pain, habitual self manipulation of her back and habitual, excessive regurgitation. After suffering with rumination for 10 years, the patient reported marked reduction in frequency of regurgitation only after 6 adjustments and a total elimination of all symptoms after11 adjustments.

Interventions and Outcomes: High velocity, low amplitude chiropractic adjustments with contact specificity (i.e. Gonstead technique) were applied to the areas of subluxation that were detected using instrumentation, visualization, static spinal palpation, motion palpation and x-ray analysis (i.e. Gonstead analysis). The patient reported a total elimination of the symptoms of rumination, specifically chronic, habitual regurgitation.

Conclusion: Chiropractic care of a 14-year-old girl suffering with the symptoms of rumination was presented. The total elimination of symptoms was obtained after only 11 chiropractic adjustments, concomitant with a reduction in subluxation findings at multiple levels. Chiropractic care for such a patient deserves a considerable amount of attention. This is the first case study in the indexed literature addressing the effects of chiropractic care on the symptoms of rumination.

Key Words: *chiropractic, rumination, regurgitation, and vertebral subluxation, Gonstead technique.*

Introduction

Rumination disorder is defined by the *Diagnostic and Statistical Manual of Mental Disorders* (DSM IV) as an eating disorder seen in infants less than one year of age. After a period of normal eating habits, the child begins excessive regurgitation and re-chewing of food, which is then ejected from the mouth or re-swallowed.[1] The word rumination is derived from the Latin word *ruminare*, meaning "chew the cud". It is found to be more prevalent in those with severe mental retardation; however, rumination among adolescents and adults of normal intelligence is becoming more popular. In addition, rumination has been found to be about 5.5 times more predominant in males.[2] The incidence of rumination in the general population or as an associated symptom in eating disorders is unknown and not addressed in the *DSM-IV*[7].

Symptoms of rumination include abdominal pain, weight loss, malnutrition, halitosis, dental erosions, electrolyte imbalances, and gastric disorders which in extreme cases can result in death.[3,4,5,6,8] Rumination can be differentiated from other emetic conditions such as Cyclic Vomiting Syndrome due to the lack of nausea or retching present. It can also be differentiated from gastroparesis in that the timing of rumination is frequently long delayed after eating.[8] After an extensive search of the literature addressing rumination, it is apparent that this disorder seems to have a much broader scope than is described in the DSM-IV. Rumination has a wide array of forms and affects many different factions of the population from developmentally retarded children to adults with eating disorders.

It does appear that there are several subgroups of rumination. According to Mayes et al., there are two subgroups of rumination. The first is called psychogenic rumination and it is characterized by onset during infancy and lack of mental retardation in the majority of cases. Whereas the second type, self-stimulating rumination, occurs exclusively in mentally retarded individuals and can begin at any age.[2] Chatoor, et al., on the other hand, described three major approaches towards rumination including an organic approach, a psychodynamic

1. Cristina Esposito-Health Solutions, Bloomington IL



Three arm randomized clinical trial with two control groups

Residential addiction treatment setting.

A total of 98 subjects (14 female and 84 male) were enrolled in the year and a half study.

100% of the Active (chiropractic) group completed the 30-day program, while only 24 (75%) of the Placebo group and 19 (56%) of the Usual Care group completed 30 days.

Decreased anxiety and depression

Decreased nursing station visits.

Poor performance by the placebo group suggests that the chiropractic care had no positive placebo effect.

CASE STUDY

Chiropractic Care of a Toddler with Otitis Media Born Premature & Exposed Prenatally to Opiates and Amphetamines: A Case Study & Selective Review of Literature

Pamela Stone-McCoy, D.C., C.A.C.C.P.[1] & Callerina Natori, D.C.[2]

Abstract

Objective: To describe the benefits of chiropractic care in a 13-month-old male child diagnosed with otitis media, a history of prematurity and prenatal exposure to opiates and amphetamines.

Clinical Features: A 13-month-old male presented with complaints of otitis media. He was born premature and delivered through cesarean section and a vacuum was used for extraction. At birth his blood contained opiates, methamphetamine and other amphetamines. The patient had been experiencing bouts of otitis media since three months of age and had previously been managed by medical doctors with rounds of antibiotics and nasal saline. Chiropractic analysis revealed subluxations were located in the cervical, thoracic, lumbar and sacroiliac joint region when analyzed and were adjusted using the Activator Adjusting Instrument (AAI).

Intervention and Outcomes: The patient was assessed checked utilizing thermal scanning, Activator Methods technique and adjusted using an Activator Adjusting Instrument (AAI). The patient was checked and adjusted where vertebral subluxations were found and the mother reported that the child's otitis media had resolved the following week. The patient continues regular chiropractic treatment and has not been on any antibiotics since 13-months of age.

Conclusions: This case report illustrates the resolution of acute otitis media symptoms in a pediatric patient while under subluxation-based chiropractic care. It is recommended that the link between subluxation and visceral dysfunction, such as acute otitis media be investigated further.

Keywords: *Chiropractic, subluxation, Acute Otitis Media, pediatric, Activator Methods, Thermography, children, visceral dysfunction, adjustment, spinal manipulation, opiates, amphetamines.*

Introduction

Acute Otitis Media (AOM) is a bacterial or viral infection of the middle ear that usually accompanies an upper respiratory infection.[1] The most common age to contract AOM is between three months to three years due to the structural and functional immaturity of the Eustachian tube. The Eustachian tube in children of this age is horizontal causing the opening mechanism to be less efficient.[1] If edema with the ear is chronic a negative pressure will draw fluid into the ear, causing the acute otitis media to develop into a serous otitis media.[2]

The Eustachian tube is important because it provides drainage and ventilation sources for the middle ear via a

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Case Study & Review of the Literature

Resolution of Anxiety, Depression, Insomnia, Scoliosis & Cluster Headaches, in a Patient with Opioid Addiction Undergoing Chiropractic Care to Reduce Subluxations: A Case Study & Review of the Literature

Shawn Labelle, D.C.[1]
Marcus Steiner, D.C.[2]

1. *Private Practice of Chiropractic, Greenville, SC*
2. *Private Practice of Chiropractic, Exeter, NH*

Abstract

Objective: To report the results of subluxation-based chiropractic care in a patient complaining of anxiety, depression, insomnia, and cluster headaches while undergoing treatment and recovery from substance abuse.

Clinical features: A 21-year-old male patient presented into a chiropractic office complaining of anxiety, depression, insomnia, and cluster headaches. Patient stated he was also undergoing substance abuse treatment. X-ray radiographs revealed a 21-degree thoracic dextroscoliosis, along with cervical hypolordosis, thoracic hypokyphosis, and lumbar hyperlordosis.

Intervention and Outcome: Initial postural and radiographic examinations were performed. After being put on an appropriate care plan, the patient was assessed and adjusted when necessary for subluxation using Gonstead Chiropractic Technique (GCT), along with Chiropractic Biophysics (CBP) mirror imaging technique. Patient was also prescribed cervical traction and therapeutic exercises. Upon completion of the care plan, the patient had a 10-degree reduction in the thoracic dextroscoliosis measurement and obtained restoration of normal cervical, thoracic, and lumbar curvature. Patient decreased and eventually stopped all medication usage and has not experienced a relapse in 4½ years.

Conclusion: Subluxation-based chiropractic care played a role in the resolution of the patient's complaints. The patient was able to stop all medications and leads a productive life symptom free.

Keywords: *cluster headache, anxiety, depression, insomnia, chiropractic, subluxation, adjustment, Gonstead, Chiropractic Biophysics, substance abuse*

Introduction

Anxiety

Of all the psychiatric disorders, anxiety disorders are some of the most commonly diagnosed in the population, affecting around 18.1%.[1] Initially, patients who suffer from symptoms of one of the many different anxiety disorders will first contact their primary care physician who will then make the appropriate referral to a mental health professional. Upon referral, most anxiety disorders are successfully treated in the outpatient setting.[2] Research shows that anxiety disorders cause significant functional impairment to the patient, and are often co-morbidly diagnosed with other psychiatric diagnoses such as depression, substance abuse, and other anxiety disorders.[3] According to the DSM-IV-TR (Diagnostic and Statistical Manual of Mental Disorders, 4th edition, Text Revision), there are 12 different diagnoses that fall under the heading of an anxiety disorder. Each disorder has a specific set of identifiers that the patient must meet in order to receive the diagnosis.[4]

Case Study

Subluxation Based Chiropractic Care in the Management of Cocaine Addiction: A Case Report

Jay M. Holder, DC, CAP, DACACD[1]
Brandon E. Shriner, BS[2]

1. *American College of Addictionology & Compulsive Disorders, Miami Beach Exodus Treatment Center, Miami, FL*
2. *New Albany, OH*

Abstract

Objective: This is a case study of a 63 year old male free base and crack cocaine addict who was court mandated to the Exodus Addiction Treatment Center for residential addiction treatment following a conviction for cocaine possession along with a record of multiple felony arrests over a 40 year period.

Clinical Features: The failed to retain recovery or successfully complete eleven previous medical model/disease concept residential addiction treatment programs for free base and crack cocaine addiction. A comprehensive case history, psychosocial, neurological and addiction assessments, along with chiropractic examinations were performed. Vertebral subluxations were detected after chiropractic examination.

Intervention and Outcomes: Torque Release Technique (a non-linear tonal model), P300 Wave testing, EMG, thermography and residential addiction treatment were combined for evaluation and application of care. Adjustments were performed with the Integrator adjusting instrument and were limited to Primary Subluxation. P300 Wave testing was performed with the Enigma P300.

Conclusions: Although subluxation based chiropractic care is not recognized as the main course of treatment for addiction, it is postulated that improvement of spinal neural integrity and neural dopaminergic pathway efficiency through chiropractic adjustments may contribute to improved homeostasis, Brain Reward Cascade and Reward Deficiency Syndrome thus allowing the body to express a greater state of well-being and human potential as an outcome. Additional outcomes such as increased addiction treatment retention rates and decreases in relapse are also postulated after combining non-linear tonal chiropractic care with standard addiction treatment and behavior modification.

Key Words: *Torque Release Technique (TRT), Integrator, Enigma P300, P300 Wave, Chiropractic, Primary Subluxation, Vertebral Subluxation, Brain Reward Cascade (BRC), Addiction Treatment, Cocaine Addiction, EMG, Thermography, Cranio-spinal Meningeal Functional Unit, Reward Deficiency Syndrome (RDS).*

Introduction

The purpose of chiropractic is to optimize human potential and state of well-being. This objective is primarily realized by the successful adjustment of vertebral subluxation allowing the brain and spinal cord to effectively communicate to the rest of the body creating improved overall nervous system function. [1]

Subluxation and its association with improvements in quality of life has been anecdotally reported by chiropractors since 1895 beginning with DD Palmer, but has continued to be ignored in the scientific literature until 2000. Current research is being presented suggesting that chiropractic not only helps with musculoskeletal complaints like neck pain and headaches, but more importantly that subluxation correction allows for greater fulfillment of human potential and state of well-being thereby explaining why it has been shown to improve outcomes in addiction treatment and relapse prevention.[2, 3]

REVIEW OF LITERATURE

The Effects of Chiropractic Care on Individuals Suffering from Learning Disabilities and Dyslexia: A Review of the Literature

Yannick Pauli, DC[†]

ABSTRACT

Objective: To present current mainstream and alternative theories about learning disabilities, with a special emphasis on dyslexia, as well as to systematically review the chiropractic and related literature about the effects of chiropractic care in people suffering from learning disabilities and dyslexia, and to compare chiropractic causal theories to accepted medical models.

Methods: Computerized and hand searching of the various databases Mantis, ICL, CRAC as well as the Proceedings of the International College of Applied Kinesiology were conducted with the following index terms: "dyslexia", "learning", "learning disabilities", "learning disorders", "applied kinesiology", and "neurologic disorganization". The retrieved literature was selected or rejected according to predetermined inclusion and exclusion criteria and was subsequently classified according to level of evidence and critically reviewed on predefined methodologic criteria. We also compared the various causal chiropractic theories to accepted mainstream science causal theories of learning disability and dyslexia.

Results: Eight studies met our criteria. Four of them belonged to the lowest class of evidence, for a total of 25 anecdotal reports. The remaining four were before/after studies. None of the studies met all of our predefined methodologic criteria. Points of interests and methodologic weaknesses are discussed.

Conclusion: All studies reviewed suggested a positive effect of chiropractic care in individuals suffering from learning disabilities and dyslexia. However, the various methodological weaknesses of those studies preclude any definitive conclusions and all the results are therefore to be considered preliminary. Within those limitations, there seem to exist a potential role for chiropractic care in improving various cognitive modalities known to be essential in learning. The model of vertebral subluxation and its effects on cognitive function may serve as a link between the field of chiropractic care and the neuroscience of those disorders.

Key words: *Learning disability, dyslexia, chiropractic, ADHD*

Introduction

Learning disabilities

Although the prevalence varies according to sources, it is estimated that between 3-10% of the school-age population in the United States is considered learning disabled.[1-4] However, the definition used to classify children as learning-disabled is a contentious issue that results in problems for identification, service provision and research.[5] In consequence some authors have estimated the prevalence of school children having difficulty performing at an age-appropriate level to be 15.5%[6] and even 20%.[7]

Despite issues concerning the definition, the most cited and utilized definition[8] is that of the National Joint Committee on Learning Disabilities (NJCLD), which states:

> "Learning disabilities is a general term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction, and may occur across the life span. Problems in self-regulatory behaviors, social perception, and social interaction may exist with learning disabilities but do not by themselves constitute a learning disability. Although learning disabilities may occur concomitantly with other handicapping conditions (e.g. sensory impairment, mental retardation, serious emotional disturbance) or with extrinsic influences (such as cultural differences, insufficient or inappropriate instruction), they are not the result of those conditions or influences".[9]

While this definition appears relatively simple, there remains however some serious conceptual and pragmatic issues.[5] For example, the specific methods used to define a discrepancy (the difference between the child's ability and his/her academic

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A pilot study investigating the incidence of chiropractic care in learning disorders: A case series

Catherine G-O Bouchet, DC

Introduction

Learning disorders constitute a public health concern.[1] The international prevalence of ADD/ADHD has risen to 5%. Recent studies show that the incidence of learning difficulties, including dyslexia, dyscalculia, dyspraxia, dysphasia, range around 15% within the scholar population in the western countries.[1] The objective of this study was to determine the efficacy of specific chiropractic types of care for children presenting an issue within a panel of learning troubles and related symptoms.

The primitive reflexes—instinctive, involuntary reactions that newborn babies present with certain stimuli—arise during embryonic life. The primitive reflexes at the same time result from the rising neurological function and participate in its development. Their presence is for the emergence of the functional capacities of the nervous system. As the cortex develops, under normal maturation, the primitive reflexes tend to fade away between the ages of 4 to 12 months. It has been found that that children with learning difficulties usually present with neurosensory integration disorders, and often it has been observed that the subcortical primitive reflexes are still present.[2] Therefore, in a concommitant way, we may be able to observe posture, balance and visual coordination deficit.[3]

Methods and Intervention

This retrospective pilot study was performed in France, involving more than 30 children within a range of 6 to 16 years of age who received chiropractic care for a period of 12 months. Selection criteria focused on 10 cases of children who received only chiropractic care. For each of the 10 children selected, case histories with specific evaluation for sensory integration was performed to offer a visual picture of the degree of sensory involvement, as well as to establish a sensorial-intellectual profile chart of the child.

Primitive reflex evaluation included the Moro reflex, asymmetric tonic neck reflex and spinal Gallant reflex for the presence of sustained primitive reflexes.[4] To assess balance, one-leg-stand and tandem-walk evaluations were performed on each visit, along with postural analysis and vision coordination testing. All findings were computerized in order to report the evolution of each parameter. Low-force full spine and cranial adjustments were given with a prevalence of upper-cervical corrections. The treatments were based on the assessments of subluxation distortion patterns diagnosed by parameters within different chiropractic techniques.

When evaluating meningeal tension distortions, the techniques used included sacro-occipital technique (SOT) and Logan Basic Technique. The SOT cranial techniques included: occipital pump, sphenoid release, frontal release, cranial suture work, and balancing of cranial CSF pulsations. Releases and unwinding technique were used on the thoracic and pelvic diaphragms, and Logan Technique was applied from the sacral to occipital regions.

When there was more primary structural involvement, common treatments involved: (1) A sustained toggle at the level of C1-C2, (2) Pierce technique drop adjustment (very slight), usually for C3 or C5 posteriorities, (3) Thompson technique drops for thoracic, lumbar, sacral areas and pelvis, and (4) Extremity adjustments of the appendicular skeleton made commonly to the clavicle, humerus, wrist and hand, as well as lower extremities, which could be source of structural instability. Viscerosomatic reflex works was treated in a few cases with chiropractic manipulative reflex technique (CMRT).

The majority of the children improved their reading, writing and communication skills and related better to each other socially. As they were more balanced structurally, neurologically, and behaviorally, improvement of their schoolwork was remarked upon by their parents and teachers.

CASE STUDY

Improvement in Learning and Speech Disorder in a Child with Vertebral Subluxations Undergoing Chiropractic Care: A Case Study

Ben Lerner, D.C.[1] Sheri Lerner, D.C.[2]

Abstract

Objective: To report on improvement in learning disorder and speech delay in a four year old child undergoing chiropractic care to correct vertebral subluxations.

Clinical Features: Four year old male with history of severe learning disorder and speech delay. Objective indicators of vertebral subluxation identified via palpation, thermography and radiographs.

Interventions & Outcomes: Pettibon chiropractic technique along with manual Diversified chiropractic adjusting directed at reducing vertebral subluxations in the cervical thoracic and pelvic regions were performed. Dietary modifications were also implemented.

Conclusion: The case of a four year old male with past history of learning disorder and speech delay is presented. Dramatic improvement in neurodevelopment is noted following the introduction of chiropractic care concomitant with a reduction in vertebral subluxation. Additional research on neurodevelopmental disorders and chiropractic is warranted.

Key Words*: Learning disorder, speech delay, neurodevelopmental disorders, chiropractic, vertebral subluxation, Pettibon technique, Diversified technique, thermography*

Introduction

According to the Merck Manual, learning disabilities are conditions that cause a discrepancy between potential and actual levels of academic performance as predicted by the person's intellectual abilities. There is an array of learning disabilities that range from difficulty understanding written or spoken words to difficulty with mathematical calculations.[1]

However, they all interfere with the way a person understands, responds, and remembers new information. Unfortunately, it is usually not diagnosed until a child is of school age. The NIH states about one-third of children with learning disabilities also have attention deficit hyperactivity disorder which in turn makes diagnosis and treatment more complicated.[2]

Statistics show about 5% of school age children in the United States receive attention for learning disabilities, being more

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His speech was impaired to the extent that others could not understand him. He was not speaking when he first started school and his mother reported that this caused him to be constantly frustrated, and angry

Immediately following the first adjustment the patient began speaking and putting together full sentences that were coherent and understandable.

He was also able to recognize his written name for the first time following the first adjustment.

He has since started to color with crayons and he can now understand and follow verbal directions.

Prior to care he was emotionless but he now smiles and cries appropriately.

According to reports by the mother the patient also started to think before he reacts in certain situations and his concentration has improved.

His behavior and demeanor in the office was also noted to be improved. He had difficulty standing or lying still prior to the introduction of chiropractic care and can now remain still and undistracted while getting adjusted or doing spinal rehabilitation exercises.

Chiropractic care of a child with sensory processing disorder, speech delay, constipation, and poor sleep: A case report

Rebekah A. Wittman, DC, DACCP

Introduction:

Sensory Processing Disorder (SPD) is a complex neurological disorder that impedes integration and processing of the five senses, vestibular system, and/or proprioception.[1] The original theory of Sensory Integration Dysfunction, by occupational therapist and psychologist A. Jean Ayres, is that deficits in processing sensory information from the body and the environment lead to sensorimotor and learning problems in children. This implies that the child is unable to properly "make sense" of the incoming visual, taste, smell, touch, sound, proprioceptive and/or vestibular information, and the child's response is exhibited through poor motor planning or behavioral problems.[2] The autonomic nervous system plays a key role in SPD in that it regulates the body's ability to perceive and adapt to environmental changes through modulation of sensory, motor, visceral and neuro-endocrine functions.[3] Sleep and gastrointestinal function are influenced by the autonomic nervous system and are often affected in many children, including those with SPD.

Parents often seek chiropractic care for their children for multiple reasons, including general aches and pains; muscle conditions; ear, nose and throat issues; and respiratory and digestive disorders. This is a case report of one child with SPD that showed improved speech, behavior, sleep and bowel movements while under chiropractic care.

Method:

A case report of a 3-year-old male that presented to Kentuckiana Children's Center with sensory processing disorder, speech delay, constipation, and poor sleep. Physical examination revealed vertebral subluxations in the cervical, lumbar, and sacral regions of the spine and tension along the coronal and temporal suture.

Initial treatment plan included chiropractic adjustments twice a week for 4 weeks, then once a week for 4 weeks, and chiropractic cranial therapy once a week for 8 weeks. Methyl B12 supplementation, joint compressions and sensory activities were also implemented. Laboratory recommendations included a comprehensive stool analysis, elemental analysis, urine porphyrins and food allergy panel.

Results:

At the 8-week re-evaluation, the child was having regular bowel movements every day. The child's mother also reported fewer tantrums and an easygoing demeanor. Sleep had improved, as well, and the child was sleeping through the night 4 out of 7 nights. Speech was also improved, and he was using three- to four-word sentences.

Seven months after the onset of treatment, the child continued to have regular bowel movements, was sleeping through the night, overall better behavior and relating to other children, and better speech. His mother noted that he could carry on a full conversation, although his comprehension still seemed a little slow.

Discussion:

The sympathetic division of the autonomic system helps the body cope with stressful situations which involuntarily leads to a series of reactions resulting in increased heart and respiratory rates and decreased gastrointestinal function. The parasympathetic division is concerned with conserving and restoring energy of the body. These two divisions are coordinated in an antagonistic way[4] Since children with SPD often overreact or underreact to sensation and have a difficult time restoring balance after a stressor or challenge, it is a

CASE STUDY

Subluxation Based Chiropractic Care of a Child with Sensory Processing Disorder within a Multidisciplinary Approach

Jeff Crippen, ND, DC[1]

Abstract

Objective: Multidisciplinary care provided to a patient who presented in a chiropractic office with a diagnosis of Sensory Processing Disorder is described.

Clinical features: A three-year-old male had subluxations, positive neurological exam findings and delayed attainment of developmental milestones. His history was positive for a reaction after the Measles Mumps and Rubella (MMR) vaccine, delayed speech, head banging, irritability caused by routine sensory stimuli and analgesia. Evaluation revealed right hemisphericity. Further testing included a urine porphyrin analysis and cholesterol levels that were below the normal range.

Intervention and Outcomes: Subluxation based chiropractic care was performed to reduce / eliminate presence of subluxations. Care included manual muscle testing (MMT) to identify subluxations. Pulse oximety was preformed pre and post adjustment. Comprehensive approach included Nutrition Response Testing (NRT) to address functional physiologic imbalances through nutritional supplementation as well as incorporation of exercises and adjustments based on the hemispherical model. Dietary modifications were also made. Patient demonstrated increased oxygen saturation, improved communication, fine and gross motor skills, level of engagement and sensory integration as a result of care plan.

Conclusions: Patient demonstrated considerable improvement through subluxation based chiropractic care. Acceleration of this improvement was noted with implementation of comprehensive protocol.

Key Words: *Sensory Processing Disorder, Chiropractic, Oxygen, Cholesterol, Manual Muscle Testing*

Introduction

Sensory Processing Disorder (SPD) is a distinct clinical entity characterized by a dysfunction in the use and processing of sensory information for self-regulation, motor performance and function.[1] The term was coined by Ayers in 1972 and simplistically describes a dysfunctional sensory system which is characterized by dysfunction in the areas of prioritizing and synthesizing environmental input.[2] This leads to a situation where instead of smoothly integrating afferent information and generating an appropriate response, the brain shuts out certain inputs so as not to be overloaded. This results in inappropriate responses to environmental stimuli.[2] This can take the form of either over or under reaction to the environment.

The result is the child does not appropriately respond to the given stimuli. This commonly takes the form of poor organization and motor planning as well as behavior

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Case Study

Improvement in Sensory Modulation & Functional Disorders in a Female Pediatric Patient Undergoing Chiropractic Care

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Abstract

Objective: To describe the chiropractic care of a pediatric patient presenting with Sensory Modulation Disorder and Constipation.

Clinical Features: Patient is a 5 year-old female with history of birth trauma, developmental delays, sensory processing, sleep difficulties and other functional disorders. Objective indicators of vertebral subluxation identified via Activator Technique.

Intervention and Outcomes: Activator Technique was employed to reduce vertebral subluxations in the axial and appendicular skeleton. Following adjustments, the patient demonstrated more frequent bowel movements, less-fragmented more-restful sleep, improved mood and ability to focus.

Conclusions: Following chiropractic adjustments, the patient's nervous system was able to function at a higher level, resulting in improved bowel function, mood, ability to concentrate and engage with her environment. Additional research is needed to provide firm diagnostic criteria and a foundation for future interventions in cases of Sensory Modulation Disorder.

Key Words: *Activator, Chiropractic, Sensory Modulation Disorder, Sensory Perception Disorder, Subluxation, Adjustment, Spinal manipulation*

Introduction

Sensory Modulation Disorder

According to Ahn sensory processing in humans requires reception of physical stimulus, transduction of the stimulus into a neural impulse, and perception, or, the conscious experience of sensation.[1] Sensory systems include tactile, auditory, visual, gustatory, olfactory, proprioceptive and vestibular systems. According to Miller, Sensory Modulation Disorder (SMD) results when a person has difficulty responding to sensory input with behavior that is graded relative to the degree, nature, or intensity of the sensory information.[2] These behaviors represent an interaction between the internal environment, or the central nervous system's (CNS) ability to process and modulate sensory input, with the external environment, or the sensory experiences available throughout daily life.[3]

Dunn describes 'modulation' as "the ability to monitor and regulate information in the interest of generating an appropriate response to particular stimuli".[3] In other words, SMD represents complex neurophysiologic phenomenon where one or more of the body's senses exhibit some level of dysfunction.

These disorders reportedly occur in between 5 to 10% of children without disabilities, or as many as 40 to 88% of children with disabilities[1], particularly in children with Autism Spectrum Disorders.[4] According to a survey by Ahn et al, 5.3% of American kindergarteners, over 220,000 individuals, may have sensory processing disorders. These disabilities are associated with named disorders ranging from dysfunctional self-regulation to pervasive developmental disorders, cerebral palsy, autism spectrum disorders (ASD),[1,5,6] Asperger's Syndrome,[7] Fragile X syndrome,[8] in children without any formal diagnosis,[8] and ADHD,[8] although according to Ahn, ADHD and SPDs are distinct conditions.[1] While ASD may be considered to have overlaps with SPD, Schoen et al. showed differences between the two groups.[9]

This lack of agreement has led to difficulty in classification of SMD. Since its earliest description in 1964,[10] SMD has been refined as diagnostic criterion continue to be described as one of a complicated group of disorders. Due to the complexity of sensory modulation aberrations, it appears as though there is a continuum of these behaviors.[11] Within Sensory Modulation disorder, subtypes have been identified including sensory over-responsivity, sensory under-responsivity, and sensory seeking/craving.[12] In 2007, Miller presented a classification

CASE STUDY

Resolution of Chronic Otitis Media, Difficulty Sleeping, and Tactile Hypersensitivity in a Child Undergoing Subluxation-Based Chiropractic Care

Charmaine Lanjopoulos DC & Damaris Lanjopoulos DC

Abstract

Objective: To describe chiropractic care of a 2-year-old female with chronic otitis media, difficulty sleeping, irritability, skin sensitivities to clothes and being held or touched.

Clinical Features: A two year old female was brought into the office by her mother with complaints of chronic otitis media, inability to sleep through the night, and skin sensitivities/tactile hypersensitivity to clothes and touch. Medical doctors had diagnosed the patient with chronic ear infections and a fractured clavicle due to birth trauma. The patient also had episodes of temper tantrums and violence towards her older sister. Subluxations were detected in the cervical, dorsal, lumbar and sacroiliac region according to Activator Methods protocol.

Intervention and Outcomes: The patient received chiropractic care utilizing the Activator Methods Technique. After three adjustments the patient slept through the night for the first time. After four months of care she no longer had ear infections, she was consistently sleeping through the night, was less irritable, able to wear clothes without discomfort, and much more willing to hug and be held.

Conclusion: A positive outcome in a case of a two year old with chronic otitis media, sleeping difficulties, tactile hypersensitivity and vertebral subluxation is described. Research has shown a relationship between chronic ear infections and upper cervical subluxations as well as a relationship between upper cervical subluxations and sleeping difficulties. There is a need for further research to show the connection between vertebral subluxations, chronic otitis media, sleeping difficulties, and sensory integration.

Key Words: *Chiropractic, otitis media, sleep, Activator Methods, adjustment, skin sensitivities, sensory integration dysfunction, autism spectrum, tactile hypersensitivity, vertebral subluxation*

Introduction

Otitis media is currently defined as inflammation of the middle ear without reference to causation or etiology.[1] Otitis media has also become the most common infection in children that are sick as well as the number one reason antibiotics are prescribed to children.[1,2] Otitis media has many subgroups: otitis media with or without effusion, chronic otitis media, acute otitis media, and bacterial otitis media.

Otitis media is a multidimensional infection that has many causes and a multitude of epidemiological risk factors.

Children that have a sibling history of otitis media, males, formula fed infants, being exposed to second hand smoke, seasonal effects and allergies are at a greater risk of experiencing otitis media.[3]

Otitis media has also been linked to upper respiratory infections that cause congestion throughout the respiratory tract into the Eustachian tube causing fluid build up in the ear creating an ideal environment for bacteria to grow.

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The patient was born with a broken clavicle.

At the age of 2, the child was taking at least two hours to get to sleep and would not sleep for more than four hours at a time.

She had had over 20 ear infections, severe allergies requiring a nebulizer, severe behavior problems including temper tantrums, irritability, and skin sensitivities to clothes, and sensitivities to being touched or held.

The child would also have outbursts towards her sister and threw temper tantrums. She preferred to be naked as anything close to her skin seemed to irritate it.

She did not like to be held or cuddled and was very particular about things touching her and about being touched. She was unable to dine out with her family, drive in the car, or go out and run errands with her parents without throwing temper tantrums or having some sort of outburst.

After her first adjustment she was a little less aggressive towards her sister. After three adjustments she slept through the night for the first time ever and came into the office and gave the chiropractor a hug. After four adjustments she started to experience less outbursts and was nicer to her sister. After two months of care she came into the office and gave everyone a hug. Her mother stated that clothes were no longer an issue but she was still having trouble wearing socks and shoes. After four months of care her ear infections had resolved, she consistently slept through the night, had fewer outbursts, her skin sensitivities had resolved, and she did not have issues with being held or touched. The patient has continued to receive chiropractic care and is now a full functioning normal 8 year old that loves school, ballet, and tap.

CASE STUDY

Improvements in Developmental Delay, Colic and GERD in a Child Undergoing Chiropractic Care: A Case Report and Review of Literature

Krishma Guliani, DC [1] & Drew Rubin, DC, CCSP, DACCP[2]

Abstract

Objective: To explore the effectiveness of chiropractic care using the Infant Toggle Headpiece and Logan sustained contact on a 15-month-old female with developmental delay, colic and GERD.

Clinical Features: A 15-month-old female patient presented to a chiropractic office after her mother noticed developmental delays in the child. These developmental delays included not standing, walking or talking for her age level. Previous chiropractic care had been sought for complaints of GERD and colic in the child from birth to 5 months of age. Those complaints had resolved after she received three chiropractic adjustments, once a month for three consecutive months.

Interventions and Outcomes: Patient was examined and management included using Infant Toggle Headpiece and Logan Basic protocol. Vertebral subluxations were identified at C1 and sacrum. Adjustments along with cranial work and rehabilitation exercises were also used as an adjunct to care. Improvements were noted after 18 visits as the patient was able to walk unassisted and speak 3-4 words in Greek and English. GERD and Colic had resolved after she received three chiropractic adjustments, once a month for three consecutive months.

Conclusion: The case of a 15 month old female with developmental delays, colic, and GERD is presented. Significant improvements were noted following the introduction of chiropractic care. More research is warranted in the area of developmental delays, colic and GERD and the benefits of chiropractic care for the pediatric population.

Key Index terms: *chiropractic, pediatric, development milestones, developmental delay, Autism, colic, GERD, Logan Basic Technique, Infant Toggle Headpiece, vertebral subluxation*

Introduction

Colic & GERD

Colic has been traditionally described as crying, in a healthy infant, more than three hours per day, more than three days a week, for more than three weeks.[1] It is thought to be prevalent in up to 21% of infants.[1] The continuous crying and irritability of the infant has been shown to affect the baby's development by causing delays neurologically along with negative behavioral problems up to three years of age. Children affected also tend to have more temper tantrums and sleeping difficulties.[1] One study described upper cervical adjustments using knee chest being delivered to 16 infants experiencing

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CASE STUDY

Cessation of Seizures, Behavioral Disturbances and Improvement in Cognitive Developmental Delay Following Upper Cervical Chiropractic Care in a 2 Year Old: A Case Report

Austin J. Komarek D.C.,[1] Nick Tedder D.C.,[2] Adam Tedder D.C.[2]

ABSTRACT

Objective: To evaluate and discuss the effect of knee-chest upper cervical chiropractic care on 2-year-old male patient with seizures, behavioral disturbances and cognitive developmental delay following head trauma.

Clinical Features: The patient is a 2-year old male who suffered with seizures, behavioral disturbances and cognitive developmental delays following head trauma. He experienced 1-3 seizures per week and on some occasions up to three per day. He was combative, angry and uncooperative with the parents. The patient had a developmental impairment of his language use. The parents sought chiropractic care one year and three months after the injury.

Intervention & Outcomes: After performing a case history, physical examination and chiropractic evaluation it was determined that the patient had a subluxation of the C1 (atlas) vertebra. The patient received knee-chest upper cervical chiropractic care for a period of 5.5 months, which amounted to a total of seven visits. He was checked for vertebral subluxation during every visit and was adjusted three times over the course of care. There was improvement and eventual cessation of his seizure activity following the chiropractic care. There was also improvement in the patient's behavior and cognitive development.

Conclusion: The findings presented in this case study suggest that upper cervical chiropractic adjustments may benefit patients who suffer from seizures, behavioral disturbances and developmental delay.

Key Words: *Upper Cervical Chiropractic, Knee Chest Technique, Atlas Vertebra, Subluxation, Seizure, Epilepsy, Pediatric*

Introduction

Stedman's Medical Dictionary[1] defines epilepsy as a chronic disorder characterized by paroxysmal brain function due to excessive neuronal discharge, and is usually associated with some alteration of consciousness. The diagnosis of epilepsy is dependent on the patient experiencing at least two unprovoked seizures.[2] Furthermore, the term epilepsy has been used to encompass a variety of different syndromes that have in common the symptomatic expression of recurrent unprovoked seizures.[2,3] Seizures are the result of abnormal unregulated electrical discharges of the cerebral cortex.[4] The use of electroencephalograms (EEG) and magnetic resonance imaging (MRI) assist in the detection of seizure activity in the brain and proper diagnosis.[2,4] EEG and MRI studies can also

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CASE STUDY

Resolution of Abdominal Migraines & Improvements in Concentration & Learning in a 6-Year-Old Girl Following Network Spinal Analysis Care: A Case Study

Chris Lucks, B.Sc., BChiro[1], Lisa Lucks, D.C.[2]

Abstract

Objective: To report on the improvements in a child with difficulties in concentration, learning, and abdominal migraines while receiving Network Spinal Analysis (NSA) chiropractic care.

Clinical Features: A 6-year-old girl presented with difficulties in concentration and learning since beginning school more than twelve months earlier. She also suffered from severe stomach pain for over two months diagnosed as abdominal migraines. She received NSA care over a period of six weeks. Spinal and neural integrity (SNI) was assessed and measured weekly through palpation, visual postural analysis, and heel tension scales.

Results: Improvements were seen in concentration and learning along with a complete resolution of abdominal migraines. These improvements were consistent with greater SNI (including the reduction of adverse mechanical cord tension (AMCT) and vertebral subluxation) achieved through NSA care.

Conclusion: The results documented in this case suggest comorbidity between difficulties in concentration, learning, and abdominal migraines. NSA chiropractic care was found to be of clinical benefit in this case by improving SNI. Further research is needed to investigate the relationships between SNI and co-occurring stress related conditions.

Key words: *Learning disorders, abdominal migraines, vertebral subluxation, Chiropractic, Network Spinal Analysis, Spinal and Neural Integrity, adjustment*

Introduction

Concentration problems may be linked to various physical and psychological conditions. The hallmark condition associated with difficulty concentrating is attention deficit hyperactivity disorder (ADHD). ADHD is a complex disorder that involves impairments in focus, organization, motivation, emotional modulation, memory, and other functions of the brain's management system.[1] ADHD can be classified as predominantly inattentive type (formerly called ADD), hyperactive-impulsive type, or a combined type. Other conditions that can impair concentration include certain brain conditions and emotional conditions.[2]

In New Zealand, difficulty learning is the most common type of impairment in children.[3] Six percent of New Zealand children, including 52 percent of disabled children, have a learning difficulty, and 15 – 20 % of each classroom is reported to have children with some degree of learning difficulties.[3] In the US, about 5% of the school-age population receives special educational services for learning disabilities.[4]

Difficulty learning can be due to a specific learning disorder (SLD) such as dyslexia, dyspraxia, or dysgraphia, or due to other causes such as attention problems, family problems, stress, or anxiety disorders.[4] No single cause for learning

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Improvements in occulomotor, auditory function and range of motion in a child with Down syndrome undergoing chiropractic care

Nicole Poirier Keenan, DC, DACCP

Introduction:

A recent study suggests that manipulation delivered to the neuromusculoskeletal system may create central plastic changes in the auditory system.1 The purpose of this paper is to present a case report of an infant with Down syndrome (DS), occulomotor, auditory and cervical range of motion deficiencies treated with chiropractic management.

Each year 3,000 – 5,000 children are born in the U.S. with Down syndrome. A 2002 study, "Prevalence of Down Syndrome Among Children and Adolescents in 10 Regions of the United States," published in Pediatrics, found that the prevalence of DS among children and adolescents aged 0 to 19 was 1 in 971, or approximately 83,400 children and adolescents living with DS in the Unites States.

According to Sigfried Pueschel, M.D., Ph.D., M.P.H, 60-80% of children with DS have hearing deficits caused by sensorineural loss, conductive loss related to otitis media, or both. Small ear canals are often associated with this syndrome. Children with DS often have more eye problems than other children who do not have this chromosome disorder. For example, 3% of infants with DS have cataracts that are often surgically removed. Other eye problems such as cross-eye (strabismus), near-sightedness, far-sightedness and other eye conditions are frequently observed in children with Down syndrome.

Other common DS related issues include congenital heart disease, craniofacial changes, hypothyroidism, intestinal issues and skeletal changes. Complications associated with DS include immunologic concerns, leukemia, Alzheimer disease, seizure disorders, sleep apnea and skin disorders, which may require the attention of specialists in their respective fields. Children with DS commonly need to be evaluated by an ENT for hearing and vision tests which are recommended every 3-6 months until the age of 3 years old and then annually thereafter. There is no treatment for DS, but management often involves either surgical correction of specific problems listed above, medication such as anti-seizure meds when necessary, and therapies such as physical therapy (to correct hypotonia) and speech therapy. Early intervention programs are often used with the goal of enhancing the development of infants and toddlers and helping families understand and meet the needs of their children.

Case Presentation:

An 11-week-old male with DS, fluid in both ears, having failed all allopathic model auditory tests point and only able to track light and dark was presented to this office by his mother for chiropractic evaluation and care. His mother noted that he did not respond to her coming near him when crying and appeared completely unresponsive to sounds. The child was concurrently working with an ENT and audiologist, who prior to the initial office visit did not indicate any success from their interventions. The patient was delivered in an uncomplicated vaginal birth and has had difficulty swallowing/sucking, which the mother attributed to a larger tongue, associated with DS.

Methods:

Treatment was performed by two doctors working together at a clinic in close communication regarding evaluation and treatment protocols. At the initial office visit the patient presented with a right head tilt, decreased cervical rotation and left medial canthus that is inferior and larger left as compared to the right side cranial measurement. The child had motion restriction in his left sacrum and was generally hypertonic.

Because atlanto axial instability is associated with 10-20% of individuals with DS, this area was addressed very cautiously while treating the child's cervical spine.[2] Patient was treated with low-force, specific, full-spine and cranial chiropractic manipulative therapy.

Visit 1: Immediately post adjustment, patient showed improvement in focus and pupillary constriction and dilation (alternating mydriasis) slowed from every few seconds to more responsive to environment.

He became attentive to the doctor's face and/or voice and overall hypertonicity decreased.

Visit 2: Patient's mother reported he had been calmer and slightly more responsive.

Visit 3: Mother reported he is cooing and more verbal, which was very unusual for him.

Chiropractic evaluation found cervical range of motion, particularly rotation, had improved bilaterally.

It was also noted during the examination and treatment that the child was smiling more.

Visit 4: Range of motion continued to improve along with increased responsiveness and visual tracking.

Visit 5: Allopathic visual retesting indicated tracking at age appropriate levels at that point. Mother also reported he was beginning to consistently respond to loud noises, such as a door slamming, where prior to care he had no response. Also of significance, his cooing and smiling had notably increased.

Parker Chiropractic Researcher Claims No Evidence in Regards to Chiropractic & Autism

Saturday, June 22, 2019 - 15:44

NEWS STAFF



Katherine Pohlman States We Can't Make Any Sound, Safe Statements

Two "journalists" who repeatedly publish error filled articles attacking chiropractic wrote a recent hit piece on chiropractic and its role in autism published on June 22, 2019 by ***The Atlantic.***

In that article the authors interview **Katherine A Pohlman, DC, DICCP, MS, PhD(c)** who is a researcher at **Parker University College of Chiropractic** and in regards to research on chiropractic and autism stated:

“We don’t have any current evidence to make any sound, safe statements"

College of Chiropractors of British Columbia

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Phone: 604-742-6470
www.chirobc.com

College of Chiropractors of British Columbia

Policy Title – Efficacy Claims **Responsible Office: College of Chiropractors of British Columbia ("CCBC")** **Contact:** registrar@chirobc.com	**Reference Information:** *TBD*
	Replaces former policy: NA
	Date Effective: October 1, 2018
	Last Update: NA
	Next Review Date: September 30, 2019
Keywords	**E.g. efficacy, marketing, advertising, acceptable evidence**

1. **Policy Rationale & Purpose:**

   As stated in section 14(1)(f) and Appendix "N" of the CCBC's *Professional Conduct Handbook* ("PCH"), chiropractors must not advertise health benefits of their services when there is no acceptable evidence that those benefits can be achieved. The Board is concerned registrants may be making claims in marketing or directly to patients that chiropractic care has beneficial effects on some diseases, disorders and conditions when there is no acceptable evidence for those claims.

   This policy identifies efficacy claims that are not supported by acceptable evidence, and therefore, must not be made.

2. **Policy Scope**

   This policy applies to all registrants who market or advertise their services.

3. **Policy Statement:**

   Due to the absence of acceptable evidence supporting such claims, **registrants must NOT represent** to patients or the public that chiropractic:

   (a) can be used to treat diseases, disorders or conditions such as: Alzheimer's disease, cancer, diabetes, infections, infertility, or Tourette's syndrome, or

   (b) has any beneficial effect on childhood diseases, disorders or conditions such as: ADHD (or ADD), autism spectrum disorders including Asperger syndrome, cerebral palsy, Down syndrome, fetal alcohol syndrome, or developmental and speech disorders.

   The above list of diseases, disorders or conditions is neither final nor conclusive. Absent acceptable evidence, registrants are not free to make claims about the effectiveness of chiropractic in treating a disorder, disease or condition simply because it is not included in the list.

British Columbia

Efficacy Claims Policy

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"has ***any beneficial effect*** on childhood diseases, disorders or conditions such as: ADHD (or ADD), autism spectrum disorders including Asperger syndrome, cerebral palsy, Down syndrome, fetal alcohol syndrome, or developmental and speech disorders."

British Columbia College of Chiropractors Attacks Again - This time its Websters, Labor, Birth, Birth Trauma and Hormones

Friday, December 27, 2019 - 15:46

NEWS STAFF

Meanwhile Board Members Passing these Draconian Rules Continue to Violate their own Policies

The British Columbia College of Chiropractors can't seem to stay out of the news as it continues to marginalize chiropractors who manage vertebral subluxation in a vitalistic, salutogenic manner.

As other Canadian Provinces fall in line with the example set by them, the BC College of Chiropractors (the Licensing & Regulatory Board) adopted more policies intended to **restrict the free market trade of chiropractors by adding more absurd language to their Efficacy Claims Policy and the infamous Appendix "N".**

Acceptable Evidence

Due to the absence of acceptable evidence supporting such claims, registrants must NOT represent to patients or the public that chiropractic:

(c) has any beneficial effect on fetal development or position such as: breech/breech turning or position and intrauterine/in utero constraint.

(d) has any beneficial effect on labour or birth such as: easier or shorter labour, preventing the need for medical interventions and preventing premature or traumatic birth.

(e) has any beneficial effect on hormone function or postpartum depression.

No Benefits

According to the Board of the British Columbia College of Chiropractors, chiropractic doesn't have ***any beneficial effect*** on childhood diseases, disorders or conditions

British Columbia College of Chiropractors
Efficacy Claims Policy

SUBLUXATION DENIERS
SUBLUXATIONDENIERS.COM

Parker Chiropractic Researcher Claims No Evidence in Regards to Chiropractic & Autism

Saturday, June 22, 2019 - 15:44

NEWS STAFF



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“We don’t have any current evidence to make any sound, safe statements"

No Evidence

According to Katherine Pohlman, a chiropractic researcher at Parker University:

“We don’t have any current evidence to make any sound, safe statements”

in regards to Autism & Chiropractic.

Katherine A Pohlman, DC, DICCP, MS, PhD(c)Chiropractic
Clinical Research Scientist Parker University Dallas Texas
The Atlantic. June 22, 2019

SUBLUXATION DENIERS
SUBLUXATIONDENIERS.COM

“There’s no credible evidence and it breaks my heart to say it”



https://www.screencast.com/t/GdohqUFE

ACA Says Not Enough Research to Prove Chiropractic Works in Kids

Thursday, September 15, 2022 - 15:19

NEWS STAFF



Claims We Can't Really Say For Sure What's Happening

In an interview for the Washington Post on the role of chiropractic for children, the **President of the American Chiropractic Association's (ACA) Council on Chiropractic Pediatrics** stated:

"We still haven't been able to demonstrate in the research the effectiveness that we've seen clinically. We can't really say for sure what's happening. It's sort of like a black box. But, what we do know is that, clinically, what we're doing is effective because we see a change in the symptoms of the child."



"NO EVIDENCE MY ASS"

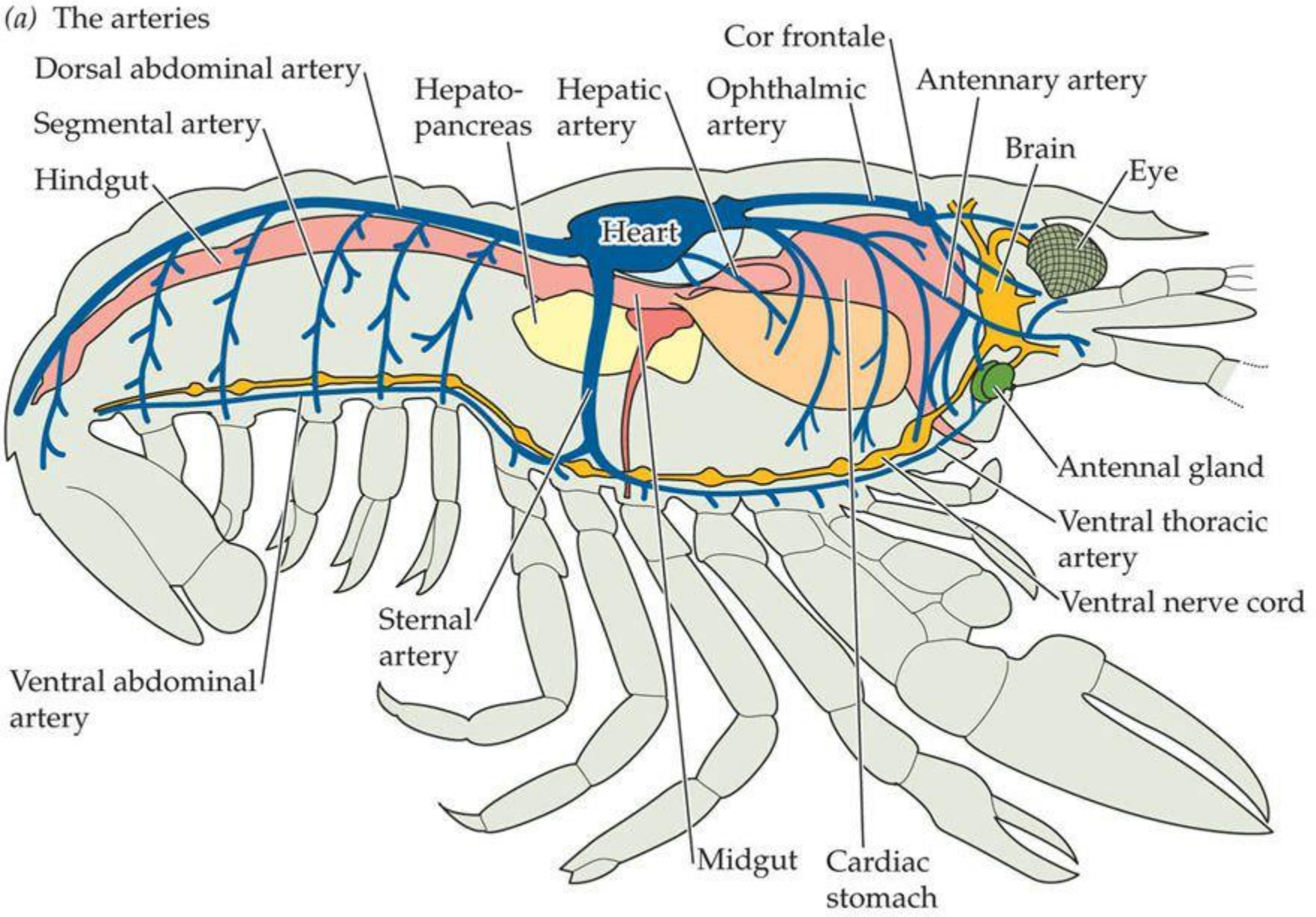
Amy Haas DC, Ph.D


IF YOU'RE NOT
OUTRAGED
YOU'RE NOT PAYING
ATTENTION

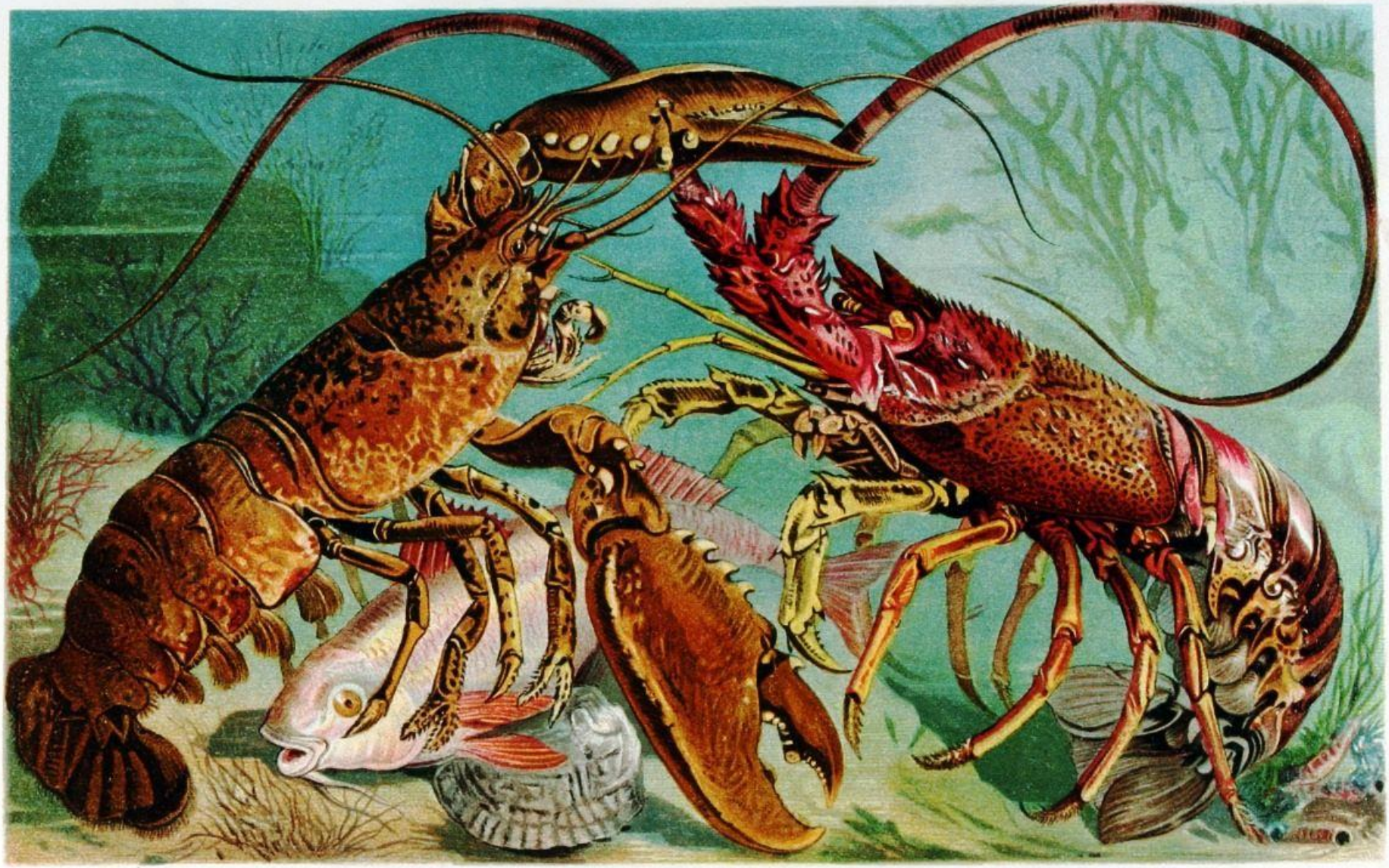
- But first . . .



Figure 23.22 Circulation through the body of a crayfish or lobster (Part 1)



ANIMAL PHYSIOLOGY, Figure 23.22 (Part 1) © 2004 Sinauer Associates, Inc.



HUMMER UND LANGUSTE.

Chemistry

- Serotonin
- Octopamine

- Ratio of two brain chemicals that modulate communication between lobster neurons

- Winning increases the ratio of serotonin to octopamine



Octopamine

Octopamine is an organic chemical closely related to norepinephrine, and synthesized biologically by a homologous pathway. Its name derives from the fact that it was first identified in the salivary glands of the octopus. In many types of invertebrates octopamine is an important neurotransmitter and hormone.

Molar mass: 153.178 g/mol

CAS ID: 104-14-3

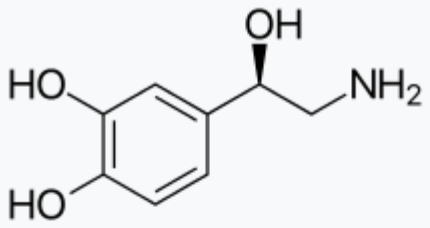
Classification: Organic compound

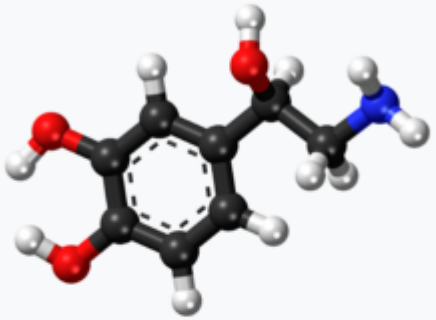
Receptors: TAAR1 (mammals); OctαR, OctβR, TyrR (invertebrates), Oct-TyrR

Source tissues: invertebrate nervous systems; trace amine in vertebrates

Agonists: Formamidines (amitraz (AMZ) and chlordimeform (CDM))

Norepinephrine





Clinical data	
Other names	NE, NA, Noradrenaline, (*R*)-(−)-Norepinephrine, l-1-(3,4-Dihydroxyphenyl)-2-aminoethanol
Physiological data	
Source tissues	locus coeruleus; sympathetic nervous system; adrenal medulla
Target tissues	system-wide
Receptors	α_1, α_2, β_1, β_3
Agonists	sympathomimetic drugs, clonidine, isoprenaline
Antagonists	Tricyclic antidepressants, beta blockers, antipsychotics
Precursor	dopamine
Biosynthesis	dopamine β-monooxygenase
Metabolism	MAO-A; COMT

Serotonin

Serotonin or 5-hydroxytryptamine is a monoamine neurotransmitter. Its biological function is complex and multifaceted, modulating mood, cognition, reward, learning, memory, and numerous physiological processes such as vomiting and vasoconstriction. Wikipedia

Formula: $C_{10}H_{12}N_2O$

Molar mass: 176.215 g/mol

Boiling point: 780.8°F (416°C)

Melting point: 333.9°F (167.7°C)

Metabolism: MAO

IUPAC ID: 3-(2-aminoethyl)-1H-indol-5-ol, 5-Hydroxytryptamine

Lobster Posture

- A lobster with high levels of serotonin and low levels of octopamine is a cocky, strutting shellfish
- This is because serotonin helps regulate postural flexion.
- A flexed lobster extends its appendages so it can look tall and dangerous

Lobsters

- If the dominant lobster is defeated its brain basically dissolves and it grows a new subordinate brain.

- Its original brain is not sophisticated enough to manage the transition from dominator to dominated.



Lobtsers

140 Million Years

Disease VS Dis-Ease

“Do not forget that chiropractors did not treat diseases. They adjust causes, whether acquired, spontaneous, or the result of accident.”

— Daniel D. Palmer

Cultural Authority

Strategic Competitive Advantage

Vertebral Subluxation

Subluxation is a Fraud



Programmes promoting and teaching unorthodox explanatory frameworks, such as *life force, innate intelligence, vitalism* and a belief that manipulating the spine to remove restrictions or *'chiropractic subluxations'* can restore health more broadly, will not meet these Education Standards



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Innes et al. Chiropractic & Manual Therapies (2022) 30:30
https://doi.org/10.1186/s12998-022-00440-6

Chiropractic & Manual Therapies

RESEARCH Open Access

Who are the chiropractic students favouring a limitless scope of practice? Exploring the relationship with personality, magical thinking, and academic achievement

Stanley Innes[1,3*], Guillaume Goncalves[2,3] and Charlotte Leboeuf-Yde[4]

Abstract

Introduction: Some chiropractors seem to have an inflated belief in the powers of spinal manipulation (SMT), for example aiming at preventing future spinal degeneration and health problems, activities that are without supporting evidence. Non-evidenced health beliefs have been shown to be associated with a tendency toward magical thinking. Holding such beliefs about SMT is associated with a limitless scope of practice (LLSoP). Recent studies have shown that "chiropractic conservatism" (ChiroCon) is also associated with such approaches. We wanted to understand ChiroCon and these attitudes toward SMT by exploring three different factors: intolerance to uncertainty, academic achievement, and tendency toward magical thinking and how they relate to ChiroCon and LLSoP.

Method: A cross-sectional survey of 243 chiropractic students from an Australian chiropractic program was conducted in May 2020. Students answered a questionnaire involving a patient case-scenario for LLSoP, levels of ChiroCon, validated questionnaires on (i) Intolerance of uncertainty, (ii) Academic achievement, and (iii) Magical thinking. LLSoP was defined as wanting to treat with SMT a 5-year-old asymptomatic child for future (i) Musculoskeletal (MSK) problems and/or (ii) Non-musculoskeletal diseases. Logistic regression models were used to confirm if there was an association between ChiroCon and LLSoP and to explore associations between LLSoP and (i) Intolerance of uncertainty, (ii) Academic achievement, and (iii) Magical thinking. We repeated the same analyses using ChiroCon as the outcome variable.

Results: We confirmed that chiropractic students in the more extreme ChiroCon group were more likely to want to prevent future spinal disorders in an asymptomatic 5-year-old child as compared to those with lower levels (OR = 3.9, (95%CI 1.97–7.72). This was also the case for the prevention of future diseases in the same child (OR = 6.9, (95%CI 3.11–15.06). Of the three predictor variables, magical belief was positively associated with both ChiroCon and LLSoP.

Conclusion: Not surprisingly, ChiroCon is closely related to LLSoP and both were linked to magical thinking. Therefore, the questionnaire 'Magical Health Beliefs' could be a useful instrument to screen future chiropractic students to prevent a mismatch between student and institution. Depending on the outlook of the school, some schools would welcome these students, whereas other institutions would want to avoid them in their education program.

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Full list of author information is available at the end of the article

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Inflated Beliefs

Some chiropractors seem to have an **inflated belief** in the powers of spinal manipulation (SMT), for example aiming at preventing future spinal degeneration and health problems, activities that are **without supporting evidence**.

Non-evidenced health beliefs have been shown to be associated with a **tendency toward magical thinking**.

Holding such beliefs about SMT is associated with a limitless scope of practice (LLSoP). Recent studies have shown that “chiropractic conservatism” (ChiroCon) is also associated with such approaches

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Magical Thinking

Logistic regression models were used to confrm if there was an association between ChiroCon and LLSoP and to explore associations between LLSoP and (i) Intolerance of uncer- tainty, (ii) Academic achievement, and (iii) **Magical thinking.**

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Magical Thinking?

Wanting to treat with SMT a 5-year-old asymptomatic child for future (i) Musculoskeletal (MSK) problems and/or (ii) Non-musculoskeletal diseases.

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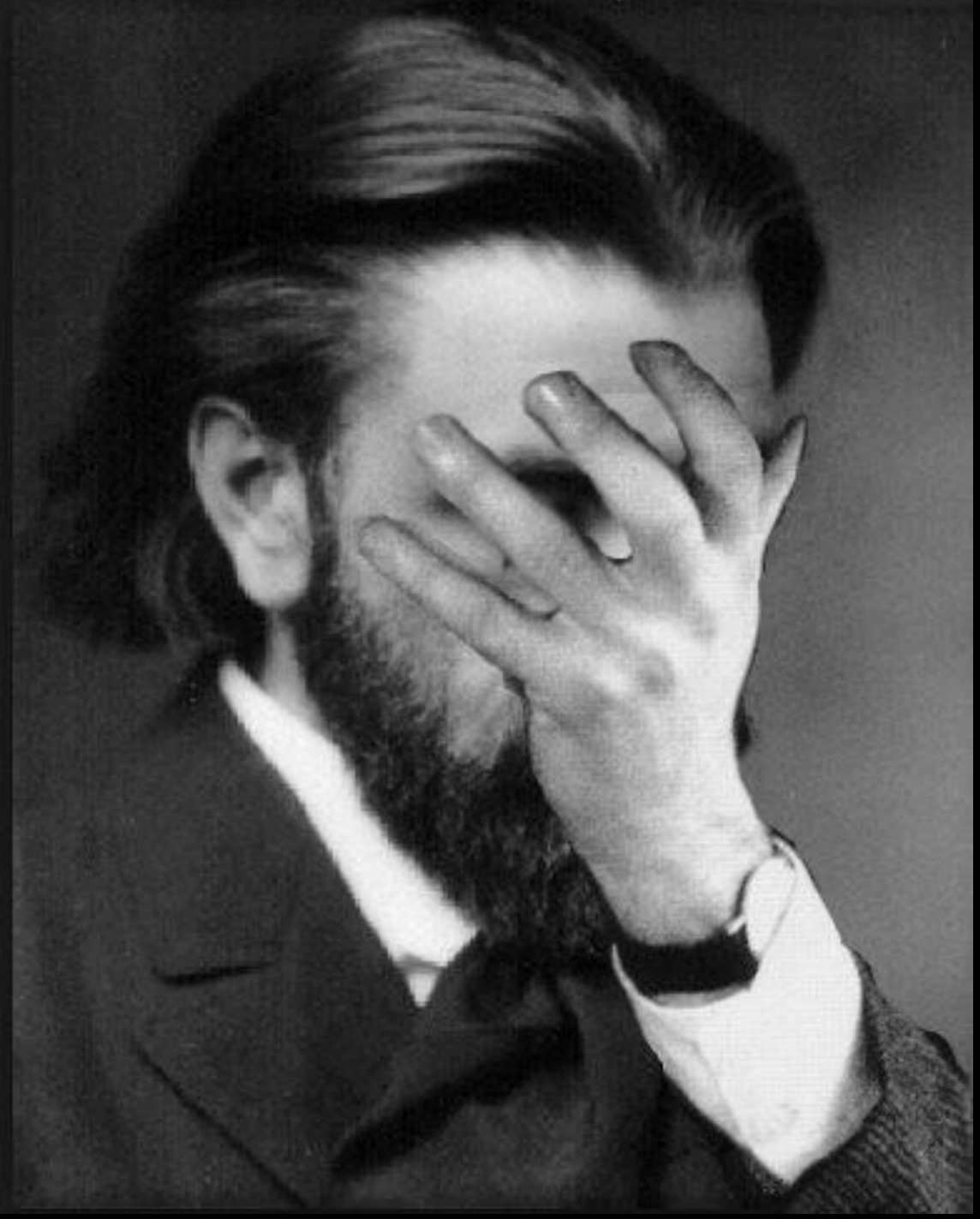


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Thought Police

“Depending on the outlook of the school, some schools would welcome these students, whereas other institutions would want to avoid them in their education program.”

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NOT MY CIRCUS
NOT MY MONKEYS

Health Policy



Policy



Chiropractors: “Every man woman and child should be checked for vertebral subluxations throughout their lives!!!”



Policymakers: Why?

Epidemiology

- Role of subluxation in health & disease
- Global Burden of Vertebral Subluxartion

Global Burden

What disables and kills people – morbidity & mortality

Incidence & Prevalence

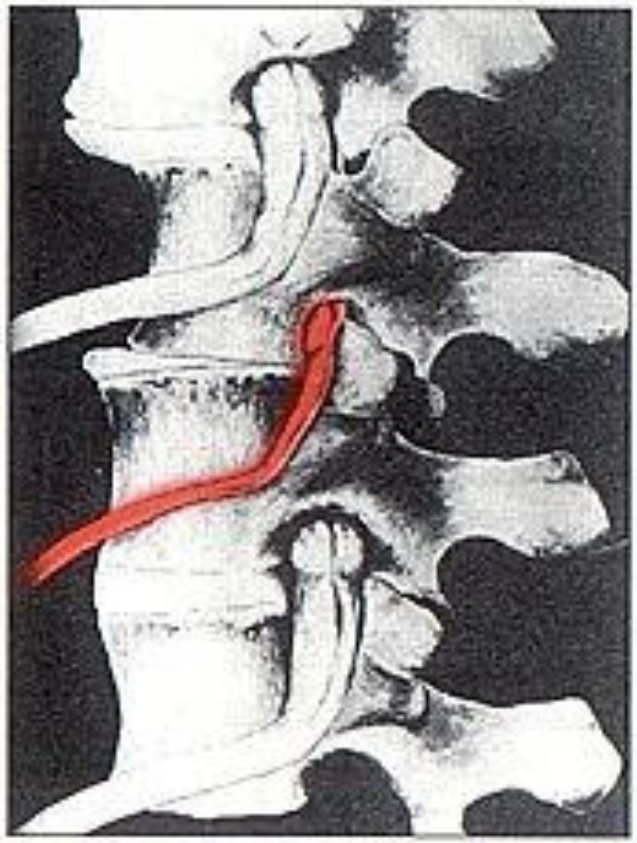
Risk factors

Relative harm

Comparison of effects

Crucial to Policymaking

The Silent Killer?



This is one type of vertebral subluxation (nerve interference) – the "silent killer."

Radical Science

- FOCUSED on vertebral subluxation.
- Use our profession's unique and distinct terminology in all research
- Vertebral subluxation is *not* the same thing as joint dysfunction.
- A specific spinal adjustment is *not* the same thing as spinal manipulation.
- Research focused on the **salutogenic** related outcomes that happen when people's subluxations are corrected.
- Research focused on the health outcomes that happen from people undergoing lifetime, family, subluxation centered chiropractic.

"The analysis and correction of vertebral subluxation for the fullest quality and expression of life."

Sufficient Evidence

There is sufficient evidence to support the management of vertebral subluxation in a vitalistic, salutogenic model.

Foundation for Vertebral Subluxation

Foundation for Vertebral Subluxation

Best Practices/Practice Guidelines

Best Practices for the Chiropractic Care of Children

Joel Alcantara, DC[1], Joey D. Alcantara, DC[2], Junjoe Alcantara, DC[3], Christopher Kent DC, JD[4], Matthew McCoy DC, MPH[5], Christie Kwon DC, MS, MPH[6], Anquonette Stiles DC, MPH[6], Jeanne Ohm DC[7], Veronica Gutierrez DC[8], Andrew Rupp DC[8], Shannon O'Brien DC[8], Anne Bishop DC[8], Stacey Rainey DC[8], Bethany Carilli DC[8] Hui Zhen Lim DC[6], Gabriel Hrebien BA[6], Justin Bedrosian DC[6], Suzzanne M. Candelaria-Perez BSc, DC[6], Christopher Long DC[6]

RECOMMENDATION

Rating: Established
Evidence: E, L

Since vertebral subluxation may affect individuals at any age, chiropractic care may be indicated at any time after birth. As with any age group, however, care must be taken to select adjustment methods most appropriate to the patient's stage of development and overall spinal integrity. Parental education by the chiropractor concerning the importance of evaluating children for the presence of vertebral subluxation is encouraged as are public health initiatives geared toward screening of children for vertebral subluxation beginning at birth.

Introduction

Since its inception, the chiropractic care of children has been an integral part of the practice of chiropractic.[1] Today, the chiropractic care of children remains an important aspect in chiropractic practice. In 2007, Barnes and colleagues[2] estimated the complementary and alternative medicine (CAM) use among U.S. adults and children from the 2007 National Health Interview Survey (NHIS), conducted by the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics (NCHS). Barnes and colleagues[2] found that approximately one in nine children used some type of CAM therapy with children having a greater likelihood of using biologically based therapies, mind-body therapies or manipulative and body-based therapies than other alternative healthcare approaches. Of the practitioner-based CAM therapies, the investigators found that chiropractic was the most popular form of non-allopathic healthcare for children. Overall, CAM therapies were used by children to address complaints associated with the musculoskeletal complaints, head or chest colds, anxiety or stress and ADHD/ADD. In a follow-up study, Black et al.[3] found similarly among 4-17 year-olds in terms of motivation for care and the utilization of chiropractic by parents for their children. In 2000, Lee et al.[4] characterized the chiropractic care of children in a survey of Boston chiropractors. Lee et al.[4] examined socio-demographics, practice characteristics, and fee structures involved in the care of children. In addition, chiropractor responders were asked about their recommendation of childhood vaccinations and their approach to care in a child with a fever. Based on the response of 90 predominantly white male chiropractors, Lee et al.[4] found an average weekly visit of 122 patients of which 11% involved the care of children and adolescents. The average visit fees were $82 and $38 for the initial and follow-up visits, respectively with only 49% of the fees covered by 3rd party payors.

1. *Director of Research International Chiropractic Pediatric Association*
2. *Private Practice of Chiropractic Alberta, Canada*
3. *Private Practice of Chiropractic Pasig City, Philippines*
4. *President Foundation for Vertebral Subluxation & Director of Center for Scholarly Activity Sherman College of Chiropractic*
5. *Vice President Foundation for Vertebral Subluxation*
6. *Research Fellow Foundation for Vertebral Subluxation*
7. *Executive Director International Chiropractic Pediatric Association (Past)*
8. *Guidelines Committee Foundation for Vertebral Subluxation*

Best Practices/Practice Guidelines

Best Practices for Chiropractic Care During Pregnancy

Joel Alcantara, DC[1], Joey D. Alcantara, DC[2], Junjoe Alcantara, DC[3], Christopher Kent DC, JD[4], Matthew McCoy DC, MPH[5], Christie Kwon DC, MS, MPH[6], Anquonette Stiles DC, MPH[6], Jeanne Ohm DC[7], Veronica Gutierrez DC[8], Andrew Rupp DC[8], Shannon O'Brien DC[8], Anne Bishop DC[8], Stacey Rainey DC[8], Bethany Carilli DC[8] Hui Zhen Lim DC[6], Gabriel Hrebien BA[6], Justin Bedrosian DC[6], Suzzanne M. Candelaria-Perez BSc, DC[6], Christopher Long DC[6]

RECOMMENDATION

Rating: Established
Evidence: E, L

During pregnancy a woman's body experiences numerous biomechanical adaptations and physiological changes. These changes often have an adverse effect on her neuro-musculo-skeletal system affecting quality of life in pregnancy, birth outcome and the future well-being of her baby. Because of these physiological compensations, care must be taken by the chiropractor to select the specific analysis and adjustment procedures most appropriate for the complex changes throughout the various stages of pregnancy. The increased potential for spinal instability in the mother and the related subluxations in the woman's spine and pelvis throughout pregnancy affect the health and well-being of both her and her baby. This warrants regular chiropractic screening in all women throughout pregnancy. Patient education pertinent to the role of chiropractic care in pregnancy is encouraged.

Introduction

With many physiological and neuro-biomechanical adaptations while carrying a fetus, the expectant mother is challenged with many physical, mental and biochemically related alterations in her physiology. With concerns of adverse events associated with medications and other interventions for the unborn fetus and mother, many pregnant women turn to complementary and alternative medicine (CAM).

In a systematic review of the primary literature (2008-2013) describing views and experiences of CAM use during pregnancy by women and healthcare professionals, Pallivalappila et al.[1] found high levels of systemic CAM use by both women and healthcare professionals during pregnancy. In fact, prior CAM use was an independent predictor for CAM use during pregnancy. Worldwide, the prevalence of CAM use by women ranges from 56% to 88% among UK women, over 50% of middle aged and older Australian women and over 90% of menopausal Canadian women.[1-4] General estimates place the prevalence of CAM use during pregnancy as high as 87%.[5]

Of the practitioner-based CAM therapies, chiropractic has been shown to be popular for women prior to and during pregnancy and in the post-partum period.[6-8] In terms of collaborative care, Metcalfe et al.[7] found that during pregnancy, compared to women who received prenatal care from a family physician, women who saw a midwife were more likely to receive chiropractic care.

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8. *Guidelines Committee Foundation for Vertebral Subluxation*

Best Practices/Practice Guidelines

Immunity & Chiropractic Clinical Practice

Matthew McCoy DC, MPH[1], Christopher Kent DC, JD[2], Anquonette Stiles DC, MPH[3], Christie Kwon DC, MS, MPH[3], Amy Haas DC, Ph.D[3], Jon Chung DC[4], Ian Shtulman DC, DAACP[5], Suzzanne M. Candelaria-Perez BSc[3], Christopher Long BS[3], Brooke Mills AA[3], Veronica Gutierrez DC[6]

RECOMMENDATION

Rating: Established
Evidence: E, L

A growing body of evidence supports our understanding of the role of the nervous system in immune system function. Basic science studies and clinical reports in the scientific literature provide supportive evidence of the beneficial effects of chiropractic care in improving function, including immune system function and quality of life. These guidelines support chiropractic practice in an evidence-informed, patient centered model. Evidence-informed practice involves the integration of the knowledge and experience of the chiropractor, the best available research evidence, and the needs and preferences of individual patients. Furthermore, chiropractors must be free to discuss, publish, and otherwise disseminate the best available evidence, and in practice, apply it to the needs of individual patients.

Foundation for Vertebral Subluxation Best Practices Initiative

Introduction

It is well established that the nervous system controls and coordinates all functions and systems of the human body including immunity and the immune system.[1] Consistent with this simple maxim of human physiology, many chiropractic practitioners hold that the impacts of chiropractic adjustment on the nervous system can confer overall salutogenic benefits in people undergoing chiropractic care.[2-4] Indeed, for well over a century, chiropractors around the world have accrued a significant body of collective clinical experience establishing that patients under chiropractic care often experience health improvements not limited to simple musculoskeletal complaints or resolution.

1. *Vice President Foundation for Vertebral Subluxation*
2. *President Foundation for Vertebral Subluxation & Director of Center for Scholarly Activity Sherman College of Chiropractic*
3. *Research Fellow Foundation for Vertebral Subluxation*
4. *Private Practice – Palm Beach, Florida*
5. *Private Practice – Lake Worth, Florida*
6. *Guidelines Committee Foundation for Vertebral Subluxation*

Recent events related to the Coronavirus Pandemic have brought this relationship between chiropractic care and overall promotion of health and wellness to the forefront, both within and outside of the chiropractic profession. Within the chiropractic profession, broad stroke assertions by researchers to the effect that no "credible" published scientific evidence supports claims of clinically relevant effectiveness of spinal adjustment and/or manipulation in boosting or strengthening the immune system.[5]

As a consequence of the assertions of the small cadre of researchers, certain chiropractic regulatory boards, chiropractic trade organizations and chiropractic educational institutions from around the world are claiming that there exists no credible, scientific evidence that would permit claims of effectiveness for conferring or enhancing immunity through spinal adjustment and/or manipulation to be made in communications by chiropractors.[6] Essentially, chiropractors have been effectively muzzled and throttled from discussing any connection between the nervous and immune systems. The conclusions of the flawed document have been refuted along with exposing the biases of the authors and the flaws of

Salutogenesis, Stress Responsivity, and Neurobiological Mechanisms Associated with Vertebral Subluxation. Review and Commentary.

Christopher Kent
Sherman College of Chiropractic



Spectrum of Care

- Pathogenic
- Therapeutic
- Salutogenic
- Non-therapeutic
- Meta-therapeutic

Pathogenic Model

Studies origins of disease

ther·a·peu·tic

/ˌTHerəˈpyo͞odik/

adjective

1. of or relating to the healing of disease.
   "diagnostic and therapeutic facilities"
   synonyms: healing, curative, remedial, medicinal, restorative, salubrious, health-giving, tonic, reparative, corrective, beneficial, good, salutary
   "the therapeutic effects of acupuncture"

noun

1. the branch of medicine concerned with the treatment of disease and the action of remedial agents.
2. a treatment, therapy, or drug.
   "current therapeutics for asthma"

Non-Therapeutic

Medical Dictionary

nontherapeutic

adj | non·ther·a·peu·tic | \-ˌther-ə-'p(y)üt-ik\

Share +1 Tweet

Medical Definition of NONTHERAPEUTIC

: not relating to or being therapy <*nontherapeutic* procedures>

Salutogenic Model

Studies origins of health

SALUTOGENESIS VS. PATHOGENESIS

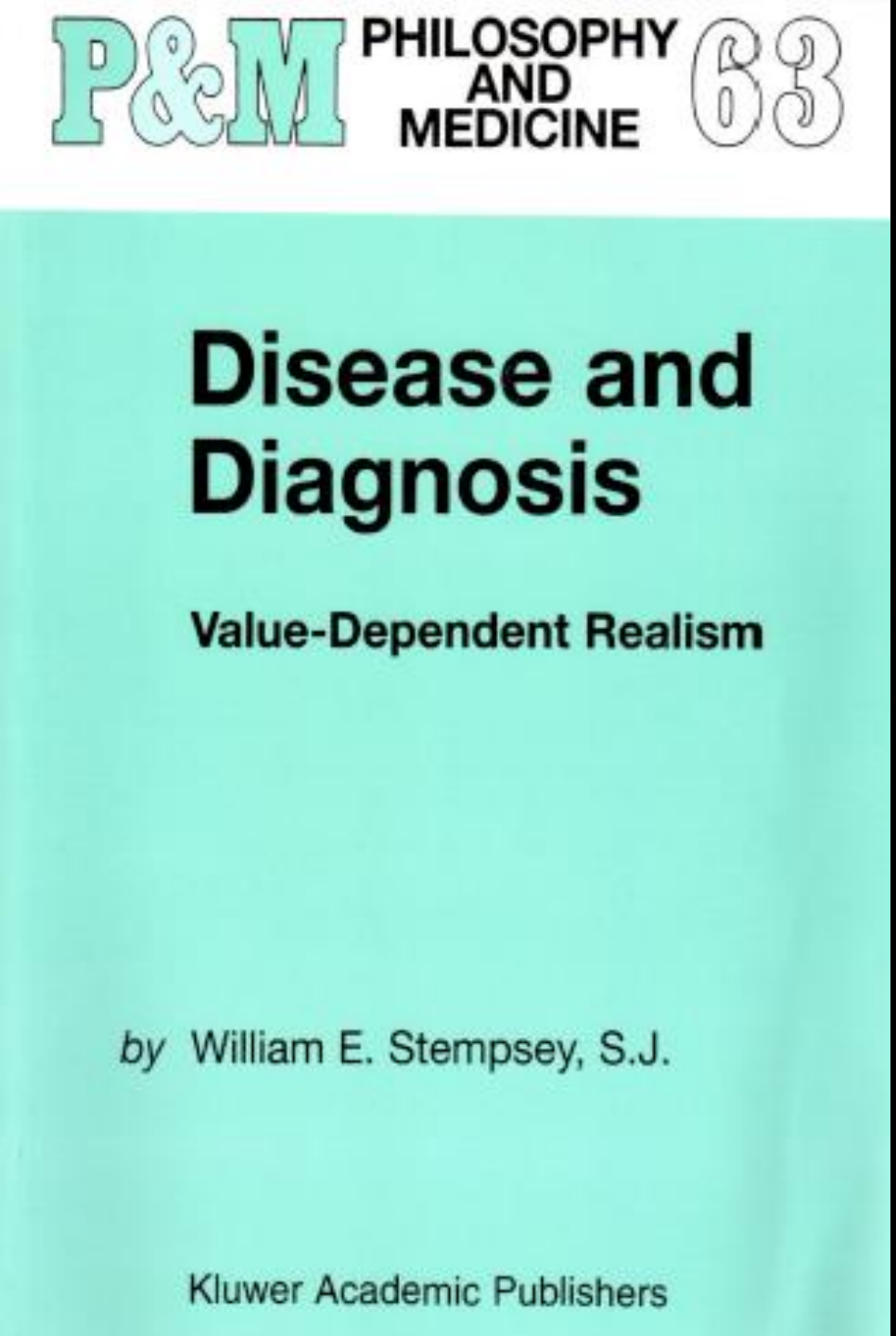
Pathogenesis Basics

- **What causes diseases?**
- **About Avoiding Problems**
- **Disease/Illness an anomaly**
- **Reactive - Absence of Disease**
- **Treat Disease**
- **Against pain or loss**
- **Prepares one to live**

Salutogenesis Basics

- **What causes Health?**
- **About Approaching Potential**
- **Inherently flawed, entropy**
- **Proactive - Presence of Health**
- **Go Get Health**
- **For Gain or Growth**
- **Discover how to live fully**

Does Disease Exist?



Disease does not exist apart from our conceptual understanding of it and is value dependent.

Practice of Chiropractic – Georgia

(a) Chiropractors who have complied with this chapter shall have the right to practice chiropractic as defined in paragraph (2) of Code Section 43-9-1 and to evaluate, diagnose, and adjust patients according to specific chiropractic methods in order to correct spinal subluxations or to adjust the articulations of the human body. Chiropractors shall observe all applicable public health regulations.

REVIEW OF THE LITERATURE

Objective Physiologic Changes and Associated Health Benefits of Chiropractic Adjustments in Asymptomatic Subjects: A Review of the Literature

Sean M. Hannon, BA, DC

ABSTRACT

Objective: To review existing literature documenting objectively measured physiologic changes and their associated health benefits subsequent to chiropractic adjustments, primarily in asymptomatic individuals.

Data Collection: "Asymptomatic" "normal" "pain-free" and "healthy" subjects were keywords used to search for articles pertaining to the objective. Data was collected directly from the bound journals of the Palmer College of Chiropractic library in Davenport, IA, Life University library in Marietta, GA, and the Sherman College of Chiropractic library in Spartanburg, SC. Some articles were downloaded from peer-reviewed journals accessible through campus Internet subscription.

Results: More than twenty studies were found documenting objective health benefits in subjects who were specifically described as "asymptomatic," "healthy," "normal," or "free from physical injury." Nearly an equal number of studies were found documenting objectively measured health benefits in subjects to which no symptomatic presentation was described.

Conclusion: The data reviewed lend support to the contention that chiropractic adjustments, often for the purpose of correcting vertebral subluxation, confer measurable health benefits to people regardless of the presence or absence of symptoms. A significant amount of preliminary evidence supports that people without symptoms can benefit from chiropractic care. Improved function can be objectively measured in asymptomatic individuals following chiropractic care in a number of body systems often by relatively non-invasive means. It is plausible that chiropractic care may be of benefit to every function of the body and have the potential for long-term, overall health benefit to those receiving chiropractic care.

Key words: *chiropractic adjustment, subluxation, objective measurement, health benefit*

Introduction

A recent survey of 658 randomly selected US chiropractors revealed some surprising data.[1] Eighty-eight percent (88.3%) of respondents agreed or strongly agreed that the purpose of maintenance care was "to maintain or optimize state of health." Eighty-percent (80.2%) of respondents agreed or strongly agreed that the purpose of maintenance care was to "determine and treat subluxation." Furthermore, US chiropractors agreed that "maintenance care was of value to all age groups, with the value increasing slightly with an increase in a patient's age." However, only forty-percent (40.2%) agreed that "adequate research existed to support the concept of maintenance care," and ninety-three percent (93.4%) agreed "there was a need for more research." It seems that US chiropractors agree and are of the opinion that correcting subluxation is of value to all people, but nearly 60% do not think there is sufficient evidence to verify their opinion. One chiropractor expressed this frustration in a Letter to the Editor in the August 6, 2000 issue of *Dynamic Chiropractic*, a trade journal of the chiropractic profession:

> "I try to encourage my patients who are open to continue maintenance care… However, I have yet to see a single research finding that indicates that those patients who do receive regular chiropractic care, regardless of symptomotology, benefit in any measurable way."
> -Scott Rogers, MA,DC

Others have expressed their opinions on the subject in peer-reviewed literature:

> "Many chiropractors will continue to adjust imaginary subluxations in the spines of perfectly healthy patients, perpetuating unsubstantiated claims and discouraging chiropractors who wish to specialize in the treatment of neck and back pain…[2] Chiropractors who believe that vertebral alignment has something to do with general health often encourage their patients to submit to regular and frequent manipulation, even when these patients are asymptomatic… I cannot personally justify manipulating the spine of a healthy, symptom-free patient… It is unfair to patients to allow them to believe that they must have regular spinal adjustments in order to stay healthy… I cannot see any basis or justification for routinely manipulating the spine of a healthy patient for the purpose of maintaining health or preventing disease."[3]
> *-Samuel Homola, DC*

Sean M. Hannon, BA, DC, Private Practice, Denver, CO

- Respiration
- ROM
- HRV
- Autonomic function
- Endocrine function
- Cardiovascular function
- Immune Function
- Muscle strength
- Athletic ability
- Neurocognitive function
- Reaction time
- Information processing
- Visual acuity
- Stress
- Reproductive hormones
- Healing
- Recovery time
- Health of senior citizens
- Reduced labor times

Hannon - Conclusion

"Considering that these initial findings document objectively measured physiologic changes and their associated health benefits in nearly every major system of the human body, it is plausible that chiropractic care may benefit every function of the body.

Furthermore, these data are congruent with numerous *subjective* studies that suggest chiropractic care is associated with accruing, long-term, overall health benefits."

Foundation for Vertebral Subluxation

THE EPIDEMIOLOGY OF VERTEBRAL SUBLUXATION

WHAT IS THE INCIDENCE & PREVALENCE OF VERTEBRAL SUBLUXATION?



SUBLUXATIONS POSE A HINDRANCE TO THE FULLEST EXPRESSION OF LIFE

Epidemiology

- What percentage of the population is subluxated?
- Does vertebral subluxation lead to increased morbidity and mortality?



KWON AWARDED PUBLIC HEALTH RESEARCH SCHOLARSHIP BY FOUNDATION FOR VERTEBRAL SUBLUXATION

FOCUS ON PUBLIC HEALTH, PREVENTION SCIENCE & VERTEBRAL SUBLUXATION

Christie Kwon DC, MS was recently awarded an Advancing Futures Research Scholarship by the Foundation for Vertebral Subluxation (FVS) to complete her Master's in Public Health at Emory University in Atlanta, Georgia.

Dr. Kwon, who is a chiropractor and also holds a Master's Degree in Biomedical Engineering, stated "Emory's focus on health promotion and prevention fits perfectly with the Foundation's research agenda. I look forward to obtaining additional skills to more effectively study the nature of subluxation and its role in health and well-being, and I am incredibly grateful for this opportunity to do so."

Remarking on the awarding of the Advancing Futures Scholarship, Dr. Christopher Kent DC, JD President of the FVS, and Professor and Director of Evidence Informed Practice at Sherman College of Chiropractic stated: "Christie Kwon is an underappreciated polymath. Her commitment to chiropractic is steadfast. This scholarship will enable Dr. Kwon to be even more effective in securing the future of chiropractic research."



"I COULD NOT BE MORE EXCITED THAT DR. KWON WAS AWARDED THIS SCHOLARSHIP AND FOR THE CRUCIAL WORK OF THE FOUNDATION THAT SHE WILL BE ADDRESSING. DR. KWON EPITOMIZES EVERYTHING WE NEED TO SECURE A FUTURE FOR CHIROPRACTIC RESEARCHERS WHO FOCUS ON THE VERTEBRAL SUBLUXATION WITHOUT THE COMPROMISE SO MANY OTHERS HAVE GIVEN IN TO."

MATTHEW MCCOY DC, MPH –
VICE PRESIDENT FOUNDATION
FOR VERTEBRAL SUBLUXATION

Vice President of the FVS, Matthew McCoy DC, MPH commented on the awarding of the scholarship to Dr. Kwon stating "I could not be more excited that Dr. Kwon was awarded this scholarship and for the crucial work of the Foundation that she will be addressing. Dr. Kwon epitomizes everything we need to secure a future for chiropractic researchers who focus on the vertebral subluxation without the compromise so many others have given in to."

Dr. Kwon anticipates that the program will create tremendous opportunities for knowledge and the building of new, professional relationships for exploring subluxation research.

Cureus

Open Access Original Article

DOI: 10.7759/cureus.48755

Secondary Analysis of a Dataset to Estimate the Prevalence of Vertebral Subluxation and Its Implications for Health Promotion and Prevention

Review began 10/09/2023
Review ended 11/09/2023
Published 11/13/2023

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Christie Kwon [1, 2], Jose N. Binongo [3], Matthew McCoy [2]

1. Department of Chiropractic Sciences, Life University, Marietta, USA 2. Board of Directors, Foundation for Vertebral Subluxation, Kennesaw, USA 3. Department of Biostatistics, Emory University Rollins School of Public Health, Atlanta, USA

Corresponding author: Christie Kwon, christie.kwon@alumni.emory.edu

Abstract

Background

Vertebral subluxation (VS) is a clinical entity defined as a misalignment of the spine affecting biomechanical and neurological function. The identification and correction of VS is the primary focus of the chiropractic profession. The purpose of this study is to estimate VS prevalence using a sample of individuals presenting for chiropractic care and explore the preventative public health implications of VS through the promotion of overall health and function.

Methodology

A brief review of the literature was conducted to support an operational definition for VS that incorporated neurologic and kinesiologic exam components. A retrospective, quantitative analysis of a multi-clinic dataset was then performed using this operational definition. Descriptive statistics on patient demographic data included age, gender, and past health history characteristics. In addition to calculating estimates of the overall prevalence of VS, age- and gender-stratified estimates in the different clinics were calculated to allow for potential variations.

Results

A total of 1,851 patient records from seven chiropractic clinics in four states were obtained. The mean age of patients was 43.48 (SD = 16.8, range = 18-91 years). There were more females (n = 927, 64.6%) than males who presented for chiropractic care. Patients reported various reasons for seeking chiropractic care, including, spinal or extremity pain, numbness, or tingling; headaches; ear, nose, and throat-related issues; or visceral issues. Mental health concerns, neurocognitive issues, and concerns about general health were also noted as reasons for care. The overall prevalence of VS was 78.55% (95% CI = 76.68-80.42). Female and male prevalence of VS was 77.17% and 80.15%, respectively; notably, all per-clinic, age, or gender-stratified prevalences were >50%.

Conclusions

To date, this is the first study of its magnitude and application of an operational definition to estimate the prevalence of VS. Albeit nonrandom, the sample had a broad geographic distribution. The results of this study suggest a high rate of prevalence of VS in a sample of individuals who sought chiropractic care. Concerns about general health and wellness were represented in the sample and suggest chiropractic may serve a primary prevention function in the absence of disease or injury. Further investigation into the epidemiology of VS and its role in health promotion and prevention is recommended.

Categories: Public Health, Epidemiology/Public Health, Integrative/Complementary Medicine
Keywords: prevention science, prevalence, epidemiology, chiropractic, vertebral subluxation

Introduction

Background and theoretical framework

Established in 1895, the chiropractic profession continues to explore the establishment of an operational definition of vertebral subluxation (VS) that is evidence-based. VS is defined by chiropractors as misalignment of the spine affecting biomechanical and neurological function; both body systems must be involved [1]. The spinal column houses and protects the spinal cord and nerve roots. According to Gray's Anatomy, "the nervous system controls and coordinates all organs and structures of the human body" [2].

How to cite this article
Kwon C, Binongo J N, McCoy M (November 13, 2023) Secondary Analysis of a Dataset to Estimate the Prevalence of Vertebral Subluxation and Its Implications for Health Promotion and Prevention. Cureus 15(11): e48755. DOI 10.7759/cureus.48755

Epidemiology

Secondary Analysis of a Dataset to Estimate the Prevalence of Vertebral Subluxation and its Implications for Health Promotion and Prevention

Christie Kwon DC, MS, MPH, Jose Binongo Ph.D, Matthew McCoy DC, MPH

Epidemiology

- ***What percentage of the population is subluxated?***

- 1,851 subjects | 7 chiropractic clinics | 4 states
- Average age: 43.48 yoa
- The overall prevalence of VS was **78.55%**

"The authors quote Gray's Anatomy about the idea that the nervous system controls and coordinates all organs and structures. This is not relevant to the study and is **untrue.** Many organs function well without nervous system control"

Stephen Perle DC, MS
Professor of Clinical Sciences
University of Bridgeport
College of Chiropractic

Akin to a Religion

"The authors suggest that radiological evaluation is needed to find a subluxation. This is a viewpoint unsupported by the scientific evidence. In fact, it appears that this idea that subluxation can be found on X-ray is more akin to a religion. The profession has actively moved away from the use of radiographs"

Stephen Perle DC, MS
Professor of Clinical Sciences
University of Bridgeport
College of Chiropractic

Liars Lie

The Senzon Papers – Exposing the Lies & Deception of the Subluxation Deniers

Tuesday, May 28, 2019 - 12:43

SIMON SENZON MA, DC, FOUNDATION FOR VERTEBRAL SUBLUXATION



An Overview of Simon Senzon's Ten Part Series - The Chiropractic Vertebral Subluxation: 1897-1997

A new series of ten papers was recently published in the Journal of Chiropractic Humanities, all written by **Simon Senzon, Ph.D. candidate at the School of Health and Human Sciences at Southern Cross University and recipient of the Foundation for Vertebral Subluxation's post-graduate scholarship**.

Simon Senzon Awarded Academic Scholarship by Foundation for Vertebral Subluxation

Thursday, October 4, 2018 - 23:15

FOUNDATION FOR VERTEBRAL SUBLUXATION

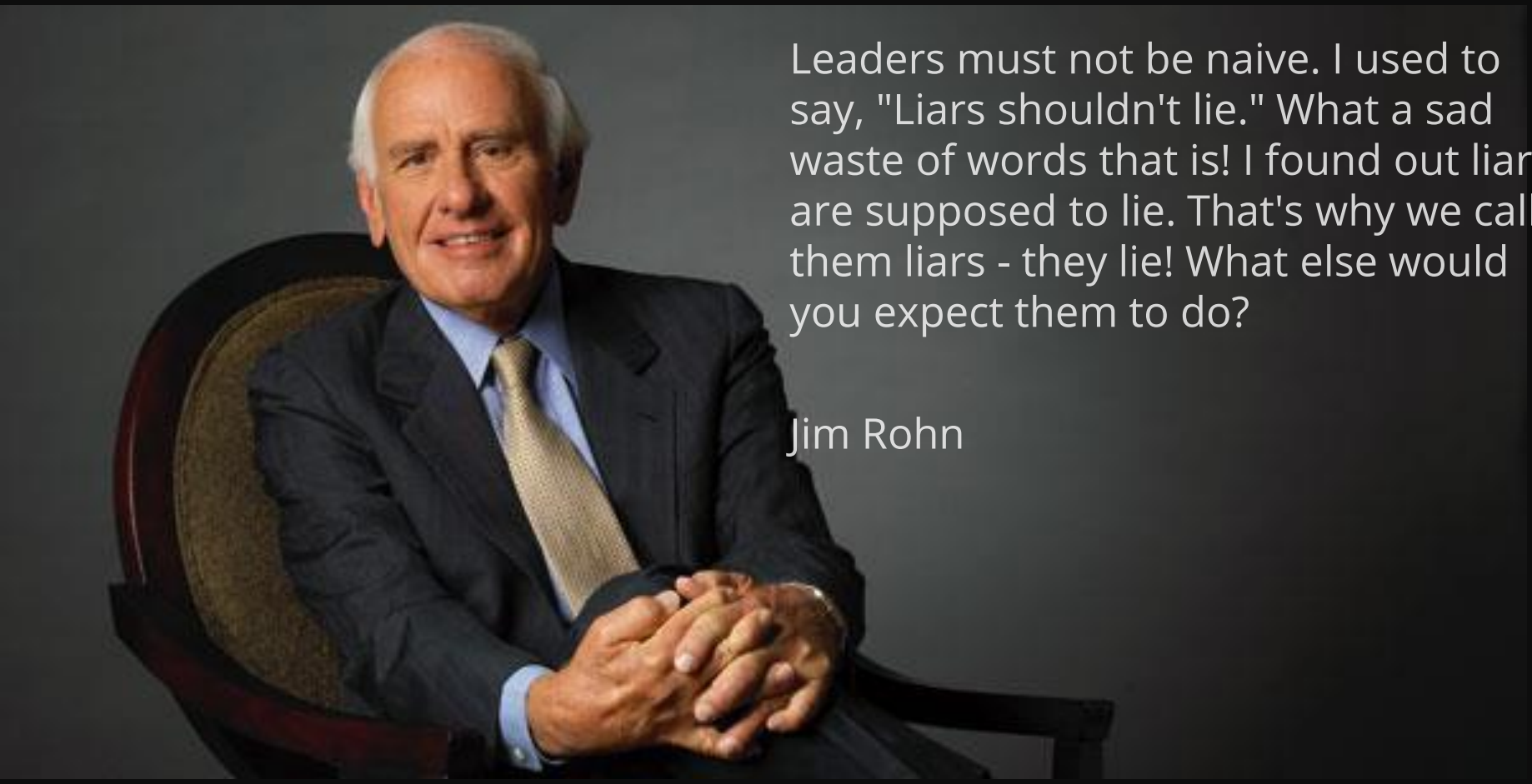


Focus is on Errors in Literature Regarding Vertebral Subluxation

Simon Senzon MA, DC, a prolific historical researcher on the chiropractic profession, has been awarded an Advancing Futures Scholarship by the Foundation for Vertebral Subluxation (FVS).

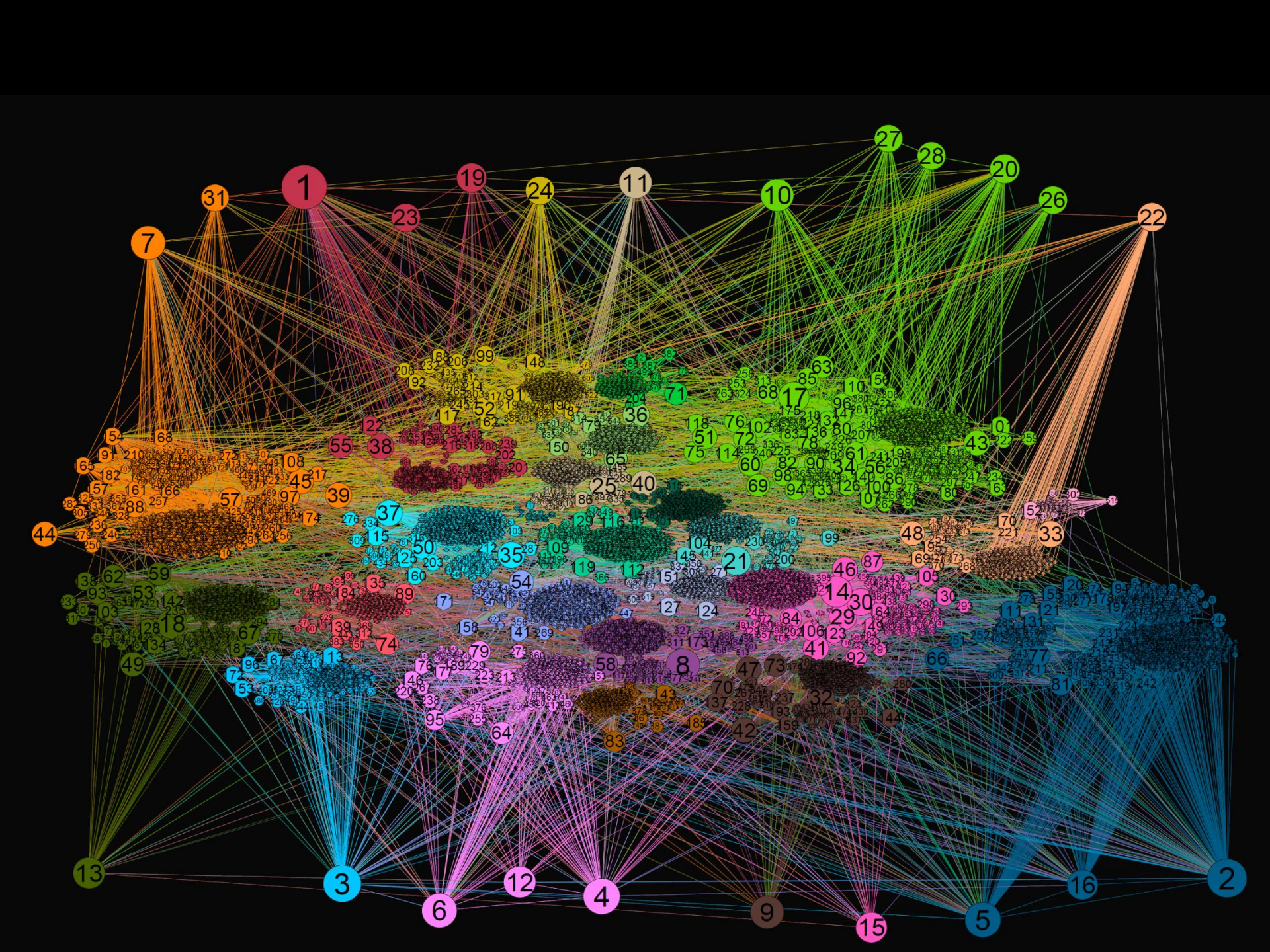
The scholarship is for Dr. Senzon to complete a Ph.D at Southern Cross University located in Australia. The focus of his scholarship and dissertation will be correcting the errors in the literature regarding vertebral subluxation placed by numerous "subluxation deniers" who have peppered the scientific and historical literature with unreferenced and unsupported statements regarding the nature and historical issues surrounding vertebral subluxation.

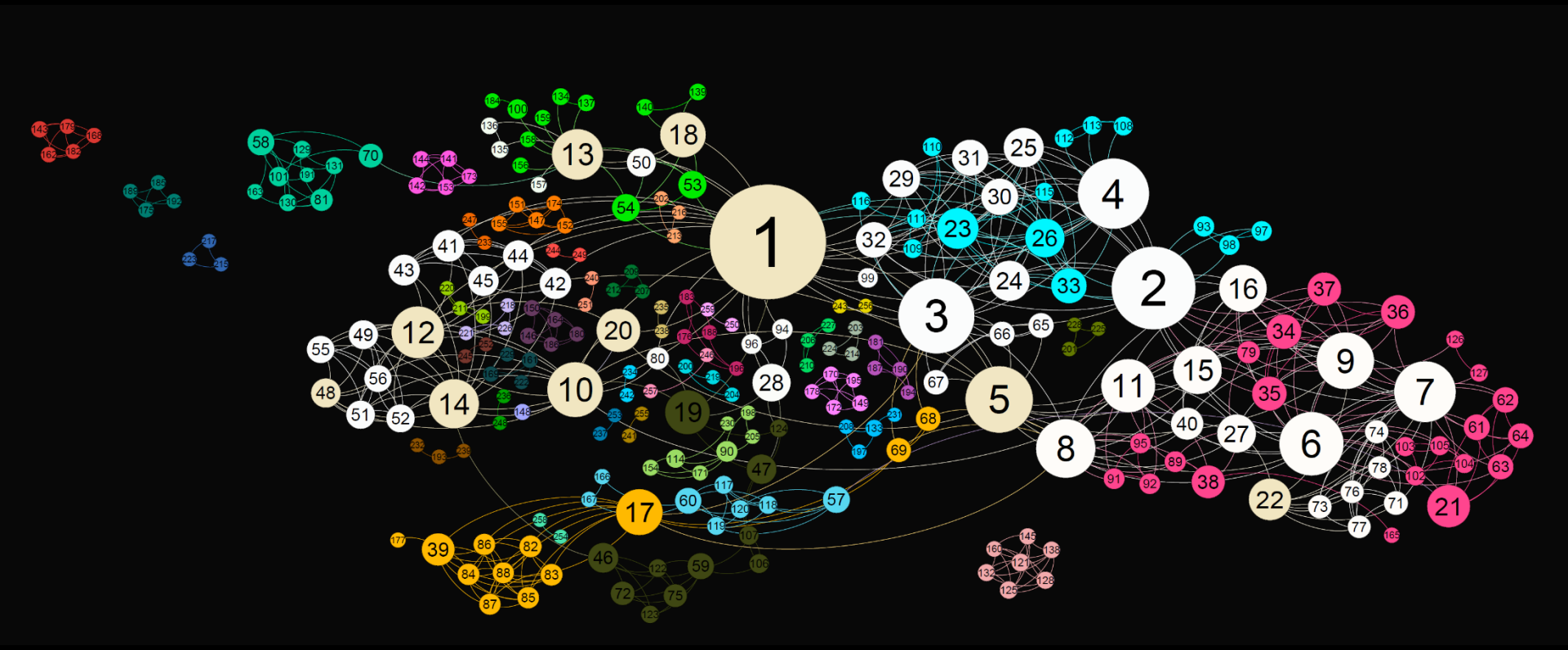
Don’t be Naïve . . .

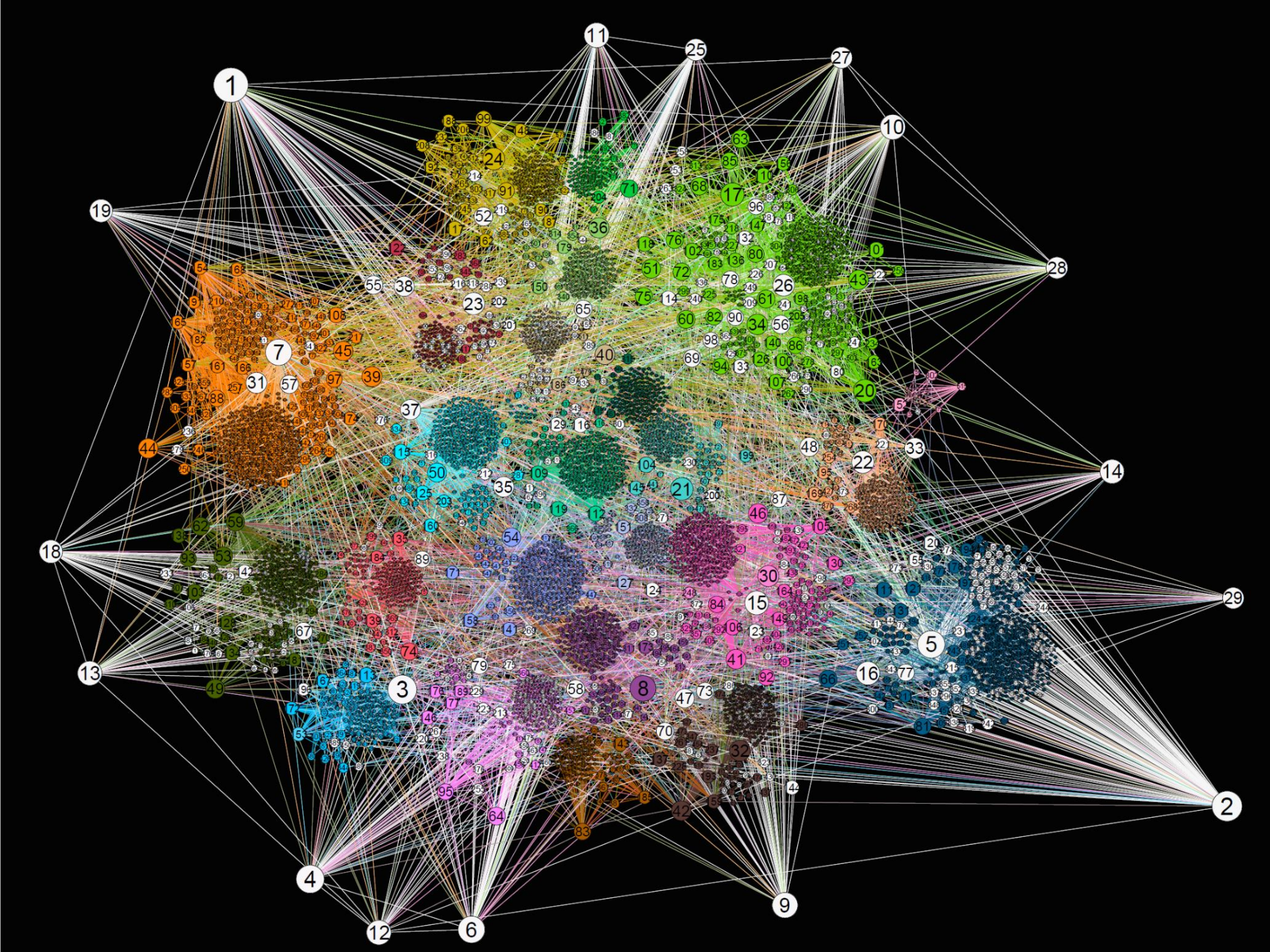


Leaders must not be naive. I used to say, "Liars shouldn't lie." What a sad waste of words that is! I found out liars are supposed to lie. That's why we call them liars - they lie! What else would you expect them to do?

Jim Rohn







Christie Kwon DC, MS, MPH
986 Mauldin St SE
Atlanta GA 30316

Lorena Verduci, Ph.D.
Academic Editor
PLOS ONE
1265 Battery Street
Suite 200
San Francisco, CA 94111, USA

May 25, 2022

RE: Appeal of Publication Decision for PONE-D-21-13548. ***Secondary analysis of a dataset to estimate the prevalence of vertebral subluxation and its implications for health promotion and prevention.***

Dear Dr. Verduci,

Thank you for your time shepherding our paper through the peer review process and providing the opportunity to respond to the peer reviewers' comments which we have done item by item below.

In addition to responding below to any legitimate questions or concerns expressed by the reviewers, we wish to point out three competing interests that we do not believe were disclosed by at least one of the Reviewers (# 4 Stephen Perle), and we believe these interests may have interfered with an objective assessment of the manuscript.

In its *Guidelines for Peer Reviewers* (https://journals.plos.org/plosone/s/reviewer-guidelines#loc-our-peer-review-process) PLOS states the following:

> A competing interest is anything that interferes with or could be perceived as potentially interfering with, a thorough and objective assessment of a manuscript. Common examples of competing interests may include:
>
> - A recent or current collaboration with any of the authors
> - Direct competition or a history of scientific conflict with any of the authors
> - An opportunity to profit financially from the work
>
> Do not accept a review assignment if you have a competing interest, or don't feel able to give an objective assessment. If you're unsure whether your relationship qualifies as a competing interest, contact the journal office for advice. If we ask you to complete the review anyway, be sure to declare the competing interest when you submit your review.

212. Senzon, S. The chiropractic vertebral subluxation part 2: The Earliest Subluxation Theories from 1897-1907. J Chiropr Humanit. 2019 Apr 6;25:22-35. doi: 10.1016/j.echu.2018.10.009. PMID: 31019418; PMCID: PMC6472119.
213. Senzon, S. The chiropractic vertebral subluxation part 3: Complexity and Identity from 1908 to 1915. J Chiropr Humanit. 2019 Apr 6;25:36-51. doi: 10.1016/j.echu.2018.10.003. PMID: 31019419; PMCID: PMC6472124.
214. Senzon, S. The chiropractic vertebral subluxation part 4: New Perspectives and Theorists from 1916-1927. J Chiropr Humanit. 2019 Apr 6;25:52-66. doi: 10.1016/j.echu.2018.05.001. PMID: 31019420; PMCID: PMC6472125.
215. Senzon, S. The chiropractic vertebral subluxation part 6: Renaissance of D.D. Palmer's Paradigm from 1949-1961. J Chiropr Humanit. 2019 Apr 6;25:86-98. doi: 10.1016/j.echu.2018.05.002. PMID: 31019422; PMCID: PMC6472123.https://doi.org/10.1016/j.echu.2018.05.002
216. Senzon, S. The chiropractic vertebral subluxation part 10: Integrative and Critical Literature from 1996 to 1997. J Chiropr Humanit. 2019 Apr 6;25:146-168. doi: 10.1016/j.echu.2018.10.008. PMID: 31019426; PMCID: PMC6472121.
217. Holt KR, Russell DG, Hoffmann NJ, Bruce BI, Bushell PM, Taylor HH. Interexaminer reliability of a leg length analysis procedure among novice and experienced practitioners. J Manipulative Physiol Ther. 2009 Mar-Apr;32(3):216-22. doi: 10.1016/j.jmpt.2009.02.009. PMID: 19362232.
218. Knutson GA, Owens E. Erector spinae and quadratus lumborum muscle endurance tests and supine leg-length alignment asymmetry: an observational study. J Manipulative Physiol Ther. 2005 Oct;28(8):575-81. doi: 10.1016/j.jmpt.2005.08.002. PMID: 16226625.
219. Pierce S. Scientific rationale, clinical protocols, and positive patient outcomes of the EPIC technique spinal procedure. Ortho & Rheum Open Access J. 2021; 17(4): 555969. DOI:.10.19080/OROAJ.2021.17.555969
220. Haas M, Cooperstein R, Peterson D. Disentangling manual muscle testing and Applied Kinesiology: critique and reinterpretation of a literature review. Chiropr Osteopat. 2007 Aug 23;15:11. doi: 10.1186/1746-1340-15-11. PMID: 17716373; PMCID: PMC2000870.

Epidemiology

- ***Does vertebral subluxation lead to increased morbidity and mortality?***

- Patients reported various spinal or extremity pain, numbness, or tingling; headaches; ear, nose, and throat-related issues; visceral symptoms; mental health concerns; neurocognitive issues; and concerns about general health as well as overall wellness

Research Agenda

Vertebral Subluxation Research: An Agenda to Explore the Epidemiology of Vertebral Subluxation and the Clinical Outcomes Related to Management

Matthew McCoy DC, MPH[1]
Christopher Kent DC, JD[2]

1. *Professor, Clinical Sciences – Life University, College of Chiropractic Marietta, GA*
2. *President – Foundation for Vertebral Subluxation*

Abstract

Background: Since its inception the chiropractic profession has been mired in debate regarding its clinical application – specifically surrounding the concept of vertebral subluxation. Despite over 100 years and some effort at developing a research agenda, the factions that embrace vertebral subluxation as a clinical entity warranting epidemiological study continue to be confronted with basic questions regarding the existence, measurement and clinical meaningfulness of vertebral subluxation. These questions form the basis for a proposal to develop a Research Agenda and related program centered on vertebral subluxation in order to elucidate the clinical manifestations of the founding principles and tenets of the chiropractic profession.

Methods: The vertebral subluxation research agenda will involve defining the current state of the science, art and literature base to determine what is known and not known about each research objective. This will allow for the most efficient use of limited resources. The agenda centers on five areas including: operational models, measurement, epidemiology, clinical strategies and health outcomes.

Discussion: In order to accomplish the goals and objectives of the research agenda, a long term project is proposed that includes creating and supporting the next generation of subluxation centered scientific researchers to carry out these projects. The research program will need to identify and continuously update a manifest of research projects directly relevant to the agenda and will need to involve a large segment of subluxation centered groups, organizations, associations, vendors, practitioners and patients. The development and implementation of central data repositories will need to be undertaken and the program and its results will need to be marketed to chiropractors, students, patients, legislators, policy makers and the general public through an integrated campaign.

Conclusion: This research agenda seeks to validate the profession's focus on the location, analysis and correction of vertebral subluxation and position chiropractic as a vitalistic, scientific, evidence-informed clinical practice. This research is expected to assist the profession in gaining a higher degree of respect, understanding and acceptance in the health care marketplace, the scientific community and among the patients it serves. Current evidence suggests that vertebral subluxation is detrimental to human health and function and as such chiropractors who manage subluxation feel an ethical and moral obligation to screen and educate the public on what it believes is a significant public health threat. To that effect this agenda also includes the marketing of the agenda itself and the results of its research endeavors in an effort to increase utilization of vertebral subluxation screening and management.

Key words: *Chiropractic, vertebral subluxation, research agenda, epidemiology, vitalism, evidence informed practice.*

Foundation for Vertebral Subluxation

Research Agenda

The agenda centers on five areas including:

- Operational models
- Measurement
- **Epidemiology**
- Clinical Strategies
- Health outcomes

Foundation for Vertebral Subluxation

RESEARCH INFRASTRUCTURE

Uncovering the Global Burden of Vertebral Subluxation: The Need for Centralized Data Repositories

Matthew McCoy, D.C.[1] *Robert H. Blanks, Ph.D*[2]

ABSTRACT

All too often, chiropractic is criticized as an "unscientific" discipline, lacking empirical research to validate the assertion that vertebral subluxations have an adverse affect on the human nervous system, on general health and well-being and by extension, society as a whole.

It is the extension to society as a whole where subluxation has been theorized to have its most detrimental effects. If this is true, then this is also where its elucidation holds the greatest promise for influencing and affecting communal expression.

The systematic study of the epidemiology and global burden of vertebral subluxation should be carried out by individuals and groups with a worldview towards chiropractic that is consistent with the theory that subluxations pose a hindrance to the fullest expression of life. The results of this type of research can then be used to drive policy, not only in health care, but in education and other sociocultural arenas.

A model of training and linking chiropractic practitioners, researchers and teaching institutions through a centralized network and a web-based, electronic data repository in order to provide comprehensive, consistent and comparable information supporting such a worldview on the global burden of vertebral subluxation is described.

Key Words: *Chiropractic, subluxation, health, quality of life, central data repository, computer networks, electronic medical records*

Introduction

For more than one hundred years forces from outside the chiropractic profession have attacked it for various reasons. Those attacks have focused on the purported unscientific nature of chiropractic and its ties to a distinctive philosophical worldview. In recent years the health care landscape has changed and many talk of a *paradigm shift* in health care and display evidence of a move toward a more patient centered approach by allopathic medicine. Enthusiasts who promote the concept of this paradigm shift also point to studies that demonstrate the large numbers of people seeking out complementary and alternative health care.[1-3] Taking this a step further we have evidence of a move from outside the profession toward the provision of care once thought to be distinctly chiropractic by other types of health care providers.[4-8]

1. Director of Research - Life University Marietta, Georgia
2. Professor of Biomedical Science - Florida Atlantic University Boca Raton, Florida

Adding momentum to the move of non-chiropractic providers offering our services we have two recent court decisions that will profoundly impact the application of chiropractic services. First, is the loss of the Trigon case which has established a federal precedent permitting discrimination against chiropractors by third party payors. Additionally, the loss of the IICFA suit has established that chiropractors do not have exclusivity regarding the management of subluxations.[9-10]

Most disconcerting is that coupled with the above events is the systematic movement within the chiropractic profession itself to move away from a focus on the analysis and correction of vertebral subluxation. There is a strong and powerful faction within chiropractic that fervently maintains that since subluxation management remains an untested, and therefore an unscientific practice, that we should abandon the term, abandon the practice and instead morph ourselves into a profession that cares for spinal disorders only.[11-15]

Through the use of a centralized data repository, important data is generated, controlled for socio-demographic, clinical and other patient variables (e.g., confounding medical conditions, etc.). Scientific questions that can be addressed by such a network include such things as:

- Incidence of vertebral subluxation worldwide.
- Benefits (primary and secondary) of chiropractic.
- Optimal duration and frequency of care.
- Health conditions benefited by chiropractic care.
- Effects of age, gender, ethnicity and prior existing conditions.
- Health, social and economic impact of subluxation.

Obstacles

- No uniformity
- Numerous operational models
- Objective, valid & reliable measures not used
- Data not centralized
- EHR systems geared toward payment
- Disparate data (think of techniques & x-ray)
- Will of the subluxation faction is missing

Cureus

Open Access Review Article

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Vertebral Subluxation and Systems Biology: An Integrative Review Exploring the Salutogenic Influence of Chiropractic Care on the Neuroendocrine-Immune System

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Abstract

In this paper we synthesize an expansive body of literature examining the multifaceted influence of chiropractic care on processes within and modulators of the neuroendocrine-immune (NEI) system, for the purpose of generating an inductive hypothesis regarding the potential impacts of chiropractic care on integrated physiology. Taking a broad, interdisciplinary, and integrative view of two decades of research-documented outcomes of chiropractic care, inclusive of reports ranging from systematic and meta-analysis and randomized and observational trials to case and cohort studies, this review encapsulates a rigorous analysis of research and suggests the appropriateness of a more integrative perspective on the impact of chiropractic care on systemic physiology. A novel perspective on the salutogenic, health-promoting effects of chiropractic adjustment is presented, focused on the improvement of physical indicators of well-being and adaptability such as blood pressure, heart rate variability, and sleep, potential benefits that may be facilitated through multiple neurologically mediated pathways. Our findings support the biological plausibility of complex benefits from chiropractic intervention that is not limited to simple neuromusculoskeletal outcomes and open new avenues for future research, specifically the exploration and mapping of the precise neural pathways and networks influenced by chiropractic adjustment.

Categories: Preventive Medicine, Integrative/Complementary Medicine, Health Policy
Keywords: evidence informed practice, chiropractic adjustment, adaptability, salutogenesis, integrative physiology, chiropractic care, vertebral subluxation

Introduction And Background

A primary function of the human body is to adapt to its environment in order to survive and propagate the species. The process of adaptation requires a patent neurological capacity to (1) rapidly and accurately sense threats to or changes in the body's internal and external environments; (2) integrate multiple forms of sensory0 information; and (3) execute a coherent, physiologically coordinated and temporally appropriate multi-system response. The human nervous system must, therefore, be capable of sensitively perceiving and accurately integrating all forms of information from its environment including physical changes, chemical changes, or emotional/social challenges, as it continually assesses and overcomes potential threats [1]. Further, it must also be capable of generating a coordinated response via a symphony of body systems, promoting coherent maintenance of adaptation within the body's dynamic equilibrium and safeguarding the body's ability to thrive under diverse circumstances [2,3].

Integrative systems biology, or integrative physiology [4], is the study of coordinated responses from functionally coupled systems such as the nervous system, the endocrine system, and the immune system, which reciprocally influence one another [5-8]. The growth in the body of research outlining the connections between these subsystems has been exponential in the past century, and has overcome the now-historical notion that the central nervous system (CNS) is "immunologically pristine" and separated from the immune system [9,10]. While the relationship between the nervous and endocrine systems has long been accepted [11], current research has elucidated and defined numerous physical and functional conduits by which the nervous system and immune system interact and achieve coherent synergy. These conduits include direct interface of the immune system with both the sympathetic and parasympathetic divisions of the autonomic nervous system [5,12-14], direct innervation and control of immune structures, including neural circuits that directly modulate antigen flow through lymph nodes [5,15,16], bidirectional interactions at the dural neuro-immune interface within the CNS [10], and shared modulation by neurotransmitters, neuropeptides, hormones, and other small molecule messengers [17-19]. Current hypotheses in the field of neuroendocrine immunology hold that neuroimmune circuits may also mediate and modulate inter-organ communication, thereby serving as the primary conductor in the coordination of human physiology as a whole [20]. In the neuroendocrine-immune (NEI) system, each of the three component arms - nervous system, immune system, and endocrine system - modulates one another via multiple means of "crosstalk," in order to achieve synergistic and integrated physiological changes and coordinated adaptation to an environmental stressor.

This growing body of research on the reciprocal nature of communication between the subsystems of the

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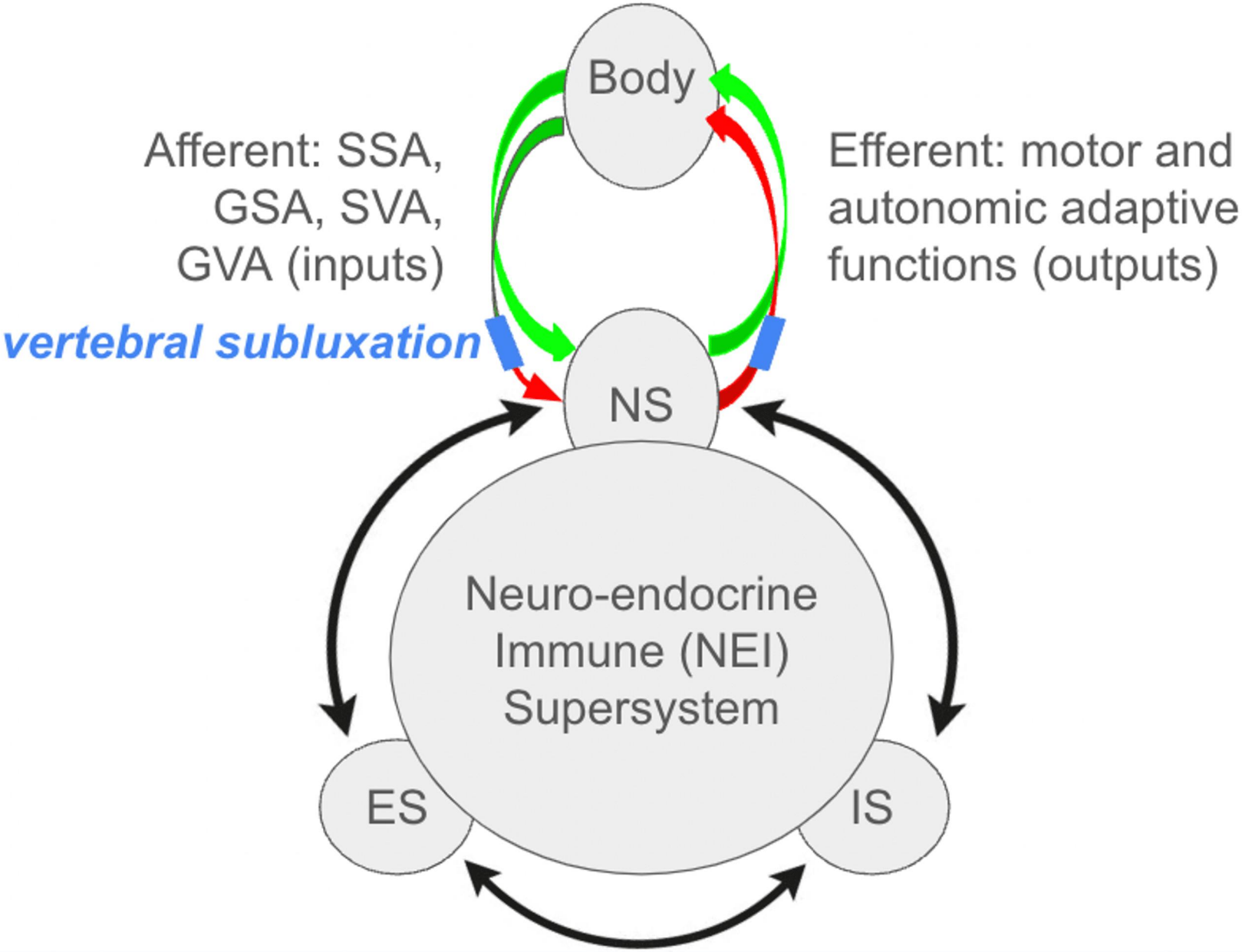
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Malpractice Insurance Program
www.chirofutures.org

In this paper we synthesize an expansive body of literature examining the multifaceted influence of chiropractic care on processes within and modulators of the **neuroendocrine-immune (NEI) system**, for the purpose of generating an inductive hypothesis regarding the **potential impacts of chiropractic care on integrated physiology**.

Taking a broad, interdisciplinary, and integrative view of two decades of research-documented outcomes of chiropractic care, inclusive of reports ranging from systematic and meta-analysis and randomized and observational trials to case and cohort studies, this review encapsulates a rigorous analysis of research and **suggests the appropriateness of a more integrative perspective on the impact of chiropractic care on systemic physiology**.

A novel perspective on the **salutogenic, health-promoting effects of chiropractic adjustment is presented, focused on the improvement of physical indicators of well-being and adaptability such as blood pressure, heart rate variability, and sleep, potential benefits that may be facilitated through multiple neurologically mediated pathways.**

Our findings support the biological plausibility of complex benefits from chiropractic intervention that is not limited to simple neuromusculoskeletal outcomes and open new avenues for future research, specifically the exploration and mapping of the precise neural pathways and networks influenced by chiropractic adjustment.


Body
Afferent: SSA, GSA, SVA, GVA (inputs)
Efferent: motor and autonomic adaptive functions (outputs)
vertebral subluxation
NS
Neuro-endocrine Immune (NEI) Supersystem
ES
IS



From the beginning . . .

Maladaptive Responses to Vertebral Subluxation

Decreased Vitality

Impaired Immune Response

Altered Metabolism/Physiology/Anatomy

Clarity of Thought

Altered Behaviors (Reward Cascade)

Genetic Expression

Foundation for Vertebral Subluxation

The Genetic Effects of Subluxation: Immediate Early Genes (IEG's)

Adrian Wenban B.Sc., B.App.Sc., M.M.Sc. & Michelle Nielsen D.C.

Abstract

Introduction - During the past decade a great deal of evidence has accumulated linking neuronal activation events to the regulation of gene expression. The first observations of transient IEG expression in the central nervous system were made after seizure activity(**1-3**) and following noxious peripheral stimulation(**4**). Since then, multiple studies have shown that many different stimuli lead to IEG expression and that short term induction of IEG's, like c-fos, in the nervous system result in long-term alterations in both gene expression and cellular phenotype.(**5-7**) Moreover, IEG's have now been shown to couple short-term neurological signals, elicited by many of the components of the vertebral subluxation(**8**), (low back/neck myospasm, ligamentous stretching, neural interference, articular derangement)(**9-14**), to long-term changes in gene expression.(**15-21**) The objective of this review is 3 fold: To examine the experimental evidence linking components of the vertebral subluxation to IEG expression in the central nervous system; to review the molecular mechanisms involved in vertebral subluxation-transcription coupling, and to review the experimental evidence which examines the consequences of vertebral subluxation-transcription coupling.

Method - A search was made of the MEDLINE database using Medical Subject Headings and free text words. The search was carried out with the intention of obtaining information from the scientific peer reviewed literature concerning human and animal studies of c-fos expression in the nervous system. The following key words were used: c-fos; Proto-oncogene; Immediate Early Gene; Nervous System; Immunohistochemistry; Spine.

Results -

- Review of the experimental evidence revealed diverse patterns of IEG expression in the central nervous system that result from the key components of vertebral subluxation(**8**) [low back/neck myospasm(**9-11**), ligamentous stretching(**12**), nociceptor afferent stimulation(**13**), articular derangement(**14**)].
- After reviewing the experimental evidence of c-fos regulation in the nervous system the likely molecular mechanisms of vertebral subluxation-transcription coupling are postulated.
- Review of the experimental evidence revealed the following consequences of vertebral subluxation-transcription coupling: Cell death(**15-18**), information processing impairment(**19**), and memory changes(**20-21**).

Conclusion - IEG's have, in animal studies, been shown to couple short-term neurological signals, elicited by many of the components of the vertebral subluxation, (myospasm, ligamentous stretching, nociceptor afferent stimulation, articular derangement), to long-term changes in cellular phenotype.

Key Indexing Terms: Chiropractic; Vertebral Subluxation; c-fos; Proto-oncogene; Immediate Early Gene; Nervous System.

Foundation for Vertebral Subluxation

Wenban – Genetic Effects

Review of the experimental evidence revealed diverse patterns of IEG expression in the central nervous system that result from the key components of vertebral subluxation:

- Myospasm
- Ligamentous stretching
- Nociceptor afferrent stimulation
- Articular derangement

Foundation for Vertebral Subluxation

Wenban – Genetic Effects

Review of the experimental evidence revealed the following consequences of vertebral subluxation:

- Transcription coupling
- Cell Death
- Information processing impairment
- Memory changes

Foundation for Vertebral Subluxation

The Genotoxic Aspect of the Vertebral Subluxation: Transcript of Lecture Given by Ronald W. Pero Ph.D

Ronald W. Pero, Ph.D[1]

ABSTRACT

This is looking at life at the chemical level. There are, basically, three main events that organize information. Duplication, transcription, of that information that's present in the DNA molecule, and then translation of that material into protein which carries out the metabolic functions in the cell. The crucial event is in duplication. That is really genetic toxicology. If the cell can't do that, it's the end. It can live with a lot of abnormalities in translation and transcription, it can't live with abnormalities in the DNA duplication. So that is what Harry Truman says, "The buck stops here". The responsibility stops here. That's it. The DNA molecule. You can't go back any further. That's what I'm offering you as a basic from which to look at the scientific basis of chiropractic. That's chemically speaking. Now this is kinetically speaking. What happens is this is just taking the human cells, the cell division cycle, it's usually about 8 hours, and this is what happens, these are different phases. We can recognize the phases in the cell very nicely. "M' is the mitosis, when the cell actually divides and the chromatin is very condensed."G1" is when the cell is preparing to replicate its DNA, "S" is when the replication actually takes place. "G2" is it begins to condense, and "M1", it actually comes apart. The events themselves are very nicely seen and very important in the duplication of cell information.

Keywords: *chiropractic, subluxation, adjustment, manipulation, oncogenes, genotoxicity, stress, immunity, cancer, mutagenesis, neuropathophysiology*

Publication Note: This paper is a reprint of the transcript from a lecture given by Ronald W. Pero Ph.D circa 1980.

Introduction

By Dr. Joseph Flesia

Every one of you knows Dr. Pero. His introduction will consist mostly of some of the new things he is doing. He is, as you all know, a member of the Chiropractic Advisory Board of Renaissance.

He is the Chairman of the newly founded Chiropractic Basic Science Research Foundation, the fund granting foundation we talked about earlier, and he is on the Peer Review Committee who will be giving out the funds to the various scientists for more conclusive research.

He is also the director of Molecular Genetics at the University of Lund in Lund, Sweden. Director of the Division of Cancer Research at the Preventive Medicine Institute, Strang Clinic, downtown Manhattan. He is the Director of the PMI Research Center for Preventive Medicine, and a Scientific Editor for the Keyser/Strang Lung Research Center.

Dr. Pero is a friend of Renaissance and, therefore, a friend of chiropractic. He will be one of the two men receiving a partial grant from the donations upstairs, to immediately begin large amounts of genetic testing of patients in Phases I and III of subluxation degeneration under long term chiropractic care.

Dr. Ronald Pero

Okay, are we ready? (A loud "Yes" from the audience). (Dr. Pero is standing with his back to the camera). Lights! Camera! Action! Let's get the camera in focus. We should get it on the right people- the audience. They're the ones who've got to be

1. Director of Molecular Genetics University of Lund, Sweden

Biochemical & Endocrinological Changes Due to Neuropathologic States That Can Lead to Gentoxic Consequences: A Testable Hypothesis for Health Effects Induced by Spinal Pathomechanics

Desmond B. Johnson, B.Sc., Ph.D[1], Ronald W. Pero, Ph.D[2], J.M. Flesia Jr., D.C.[1]

ABSTRACT

Anatomical, histopathological and neuropathological consequences of spinal cord injury have been reviewed previously. The present review concentrates on literature published since then, and is particularly concerned with the molecular events following spinal cord injury, with the emphasis on such events that relate to genotoxicity. Modern theories relating to oncogenes, to initiation and promotion, and to co-carcinogens are dealt with. There is overwhelming evidence in the literature for the role of hormones in the etiology of cancer.

As co-carcinogens, or agents of promotion, hormones have a prominent role in tumorigenesis through their influence on cellular environment and on the expression of growth capacity. In addition, some writers have suggested that hormones may also be important as initiators of neoplasia as well as being promoters of neoplasia initiated by other agents.

Because of the chronic nature of the results of many spinal injuries, to whatever degree of debilitation, the impact of stress on the human organism must be considered. Hormonal changes elicited by physical and psychological stress are summarized. While pain is included in the general context of stress, it is also treated from other viewpoints: recent literature on pain perception, on endogenous opiates, and on pain control are included in the review. In addition, attention is drawn to the side effects of some drugs, including analgesics as it is clear that some drugs are closely connected with carcinogenesis.

Key words: *chiropractic, subluxation, adjustment, manipulation, oncogenes, stress, immunity, cancer, mutageneis, neuropathophysiology*

Publication Note: This paper is a reprint of the original with the addition of an abstract and key words.

Background

Anatomical, histopathological and neuropathological consequences of spinal cord injury have been reviewed previously (Stiga & Flesia, ref.1). The present review concentrates on literature published since then, and is particularly concerned with the molecular events following spinal cord injury, with the emphasis on such events that relate to genotoxicity.

Because cancer is a main research thrust today in the health care sciences as a measure of genotoxic events, this report has an oncological orientation. Modern theories relating to oncogenes, to initiation and promotion and to cocarcinogens are dealt with. There is overwhelming evidence in the literature for the role of hormones in the etiology of cancer. As cocarcinogens, or agents of promotion, hormones have a prominent role in tumorigenesis through their influence on cellular environment and on the expression of growth capacity. In addition, some writers have suggested that hormones may also be important as initiators of neoplasia as well as being promoters of neoplasia initiated by other agents. Because of the chronic nature of the results of many spinal injuries, to whatever degree of debilitation, the impact of stress on the human organism must be considered. Hormonal changes elicited by physical and psychological stress are

1. Chiropractic Basic Science Research Foundation

Pero

"It is clear from the literature review and the data presented above that spinal pathomechanics can cause hormonal changes that, in turn can lead to genotoxic responses, altered physiological states of health and disease. Hence it becomes imperative to research the possible scientific molecular basis for chiropractic."

Johnson D, Pero R, Flesia J. Biochemical and endocrinological changes due to neuropathologic states that can lead to genotoxic consequences. A testable hypothesis for health effects induced by spinal pathomechanics. Chiropractic Basic Science Research Foundation.

Genes, Brain and Behavior
Official publication of the International Behavioural and Neural Genetics Society

Genes, Brain and Behavior (2012) 11: 3–28 doi: 10.1111/j.1601-183X.2011.00752.x

Review

Biological pathways to adaptability – interactions between genome, epigenome, nervous system and environment for adaptive behavior

C. Wolf[†] and D. E. J. Linden[*,‡]

[†]Centre for Translational Research in Systems Neuroscience and Clinical Psychiatry, Department of Psychiatry and Psychotherapy, Georg August University, von-Siebold-Straße 5, 37075 Göttingen, Germany, and [‡]MRC Centre for Neuropsychiatric Genetics and Genomics, Cardiff University School of Medicine, Cardiff CF144XN, UK
**Corresponding author: D. E. J. Linden, MRC Centre for Neuropsychiatric Genetics and Genomics, Cardiff University School of Medicine, Cardiff CF144XN, UK. E-mail: lindend@cardiff.ac.uk*

Because living systems depend on their environment, the evolution of environmental adaptability is inseparable from the evolution of life itself (Pross 2003). In animals and humans, environmental adaptability extends further to adaptive behavior. It has recently emerged that individual adaptability depends on the interaction of adaptation mechanisms at diverse functional levels. This interaction enables the integration of genetic, epigenetic and environmental factors for coordinated regulation of adaptations. In this review, we first present the basis for the regulation of adaptation mechanisms across functional levels. We then focus on neuronal activity-regulated adaptation mechanisms that involve the regulation of genes, noncoding DNA (ncDNA), ncRNAs and proteins to change the structural and functional properties of neurons. Finally, we discuss a selection of these important neuronal activity-regulated molecules and their effects on brain structure and function and on behavior. Most of the evidence so far is based on sampling of animal tissue or post-mortem studies

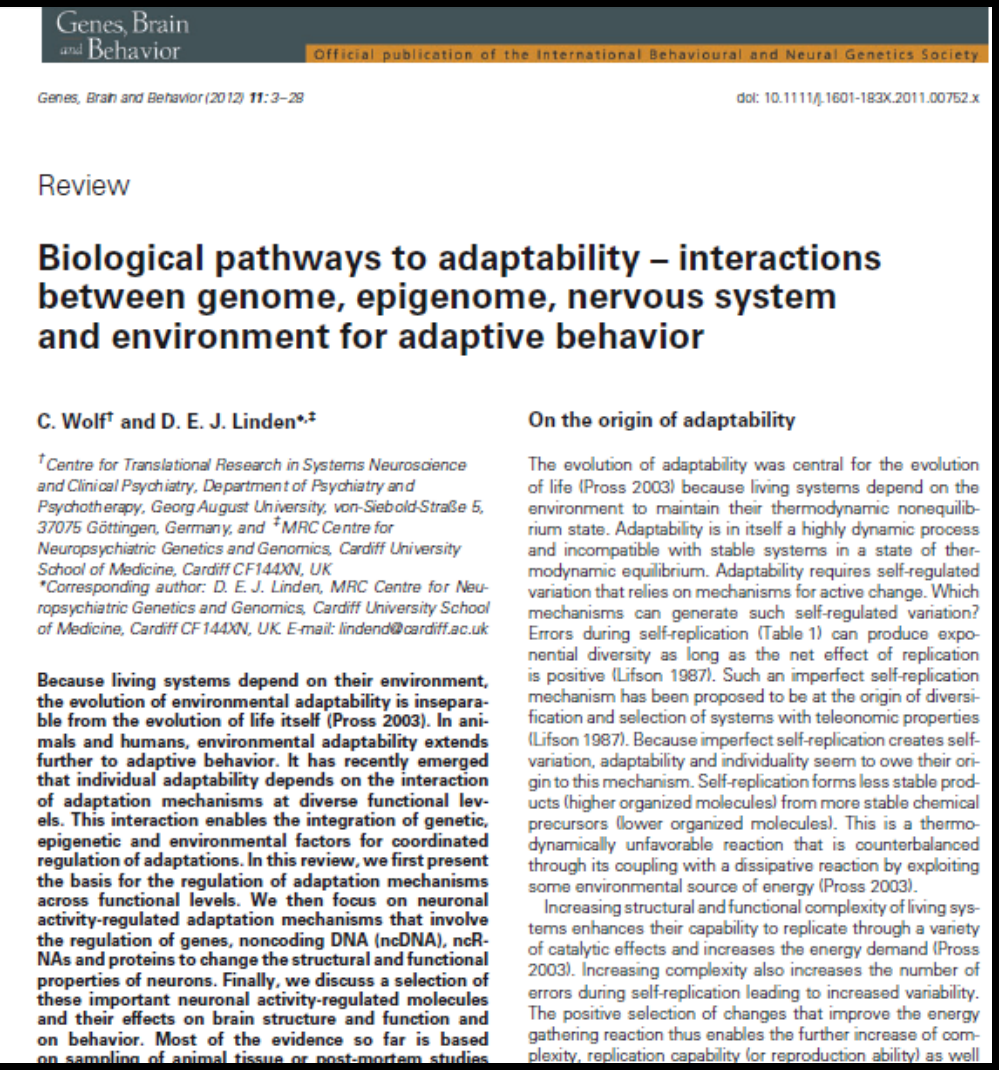
On the origin of adaptability

The evolution of adaptability was central for the evolution of life (Pross 2003) because living systems depend on the environment to maintain their thermodynamic nonequilibrium state. Adaptability is in itself a highly dynamic process and incompatible with stable systems in a state of thermodynamic equilibrium. Adaptability requires self-regulated variation that relies on mechanisms for active change. Which mechanisms can generate such self-regulated variation? Errors during self-replication (Table 1) can produce exponential diversity as long as the net effect of replication is positive (Lifson 1987). Such an imperfect self-replication mechanism has been proposed to be at the origin of diversification and selection of systems with teleonomic properties (Lifson 1987). Because imperfect self-replication creates self-variation, adaptability and individuality seem to owe their origin to this mechanism. Self-replication forms less stable products (higher organized molecules) from more stable chemical precursors (lower organized molecules). This is a thermodynamically unfavorable reaction that is counterbalanced through its coupling with a dissipative reaction by exploiting some environmental source of energy (Pross 2003).

Increasing structural and functional complexity of living systems enhances their capability to replicate through a variety of catalytic effects and increases the energy demand (Pross 2003). Increasing complexity also increases the number of errors during self-replication leading to increased variability. The positive selection of changes that improve the energy gathering reaction thus enables the further increase of complexity, replication capability (or reproduction ability) as well

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Adaptation Mechanisms



Genes, Brain and Behavior

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Review

Biological pathways to adaptability – interactions between genome, epigenome, nervous system and environment for adaptive behavior

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Neuronal activity-dependent adaptation mechanisms integrate genetic, epigenetic and experience-dependent signals.

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Adaptability

- It has recently emerged that individual adaptability depends on the interaction of adaptation mechanisms at diverse functional levels.

- This interaction enables the integration of genetic, epigenetic and environmental factors for coordinated regulation of adaptations.

Original Research

Improved Glycosylated Hemoglobin, Hyperglycemia, and Quality of Life Following Thoracic Hypokyphosis Vertebral Subluxation Correction Using Chiropractic BioPhysics®: A Prospective Case Report

Curtis Fedorchuk, DC[1]
Douglas F Lightstone, DC[1]
Robert D Comer, DC[1]
Michael T Weiner, DC[2]
Matthew McCoy, DC[3]

1. *Institute for Spinal Health and Performance, Cumming, GA*
2. *Private Practice of Chiropractic, Tucker, GA*
3. *Foundation for Vertebral Subluxation, Kennesaw, GA*

Abstract

Objective: Spinal misalignment increases spinal cord tension and is linked to various health conditions. There has never been a study on the impact of spinal alignment on blood glucose metabolism. This prospective case with long-term follow-up explores spinal alignment and its impact on type 1 diabetes mellitus.

Case and methods: A 26-year-old male presented with chronic mid-back pain for 9 years and type 1 diabetes mellitus. Radiography and MRI revealed hypokyphosis of the thoracic spine with spinal misalignment from thoracic vertebrae 6 through 9 consistent with vertebral subluxation. Glycosylated hemoglobin and blood-glucose averages were obtained by continuous glucose monitoring. Back pain, paraspinal muscle tension, and quality of life were also measured. The patient received Chiropractic BioPhysics® care including Mirror Image® corrective spinal exercises, adjustments, and traction.

Results: After 36 visits, the patient reported improvement in his mid-back pain and quality of life. Thoracic x-rays showed correction of thoracic hypokyphosis. Surface EMG measuring paraspinal muscle tension improved and continuous glucose monitoring showed dramatic drop in blood glucose immediately following the onset of each visit and improvement in blood glucose averages, percentage of time of blood glucose in a healthy target range, and glycosylated hemoglobin. The patient reported he reduced his basal insulin by approximately half during chiropractic care.

Conclusions: This case suggests that correction of thoracic hypokyphosis using Chiropractic BioPhysics® care protocols may result in improved glycosylated hemoglobin and blood glucose metabolism for a person with type 1 diabetes mellitus, as well as back pain, paraspinal muscle tension, and quality of life.

Key Words: Chiropractic BioPhysics®, adjustments, traction, vertebral subluxation; spine, Type 1 diabetes, thoracic hypokyphosis, continuous glucose meter, HbA1c

Introduction

Type 1 diabetes mellitus (T1DM) has serious short-term and long- term health implications. The disorder has a strong genetic component, but the factors that trigger onset of clinical disease remain largely unknown.[1] Hyperglycemia predisposes people with diabetes to serious health conditions and complications such as cardiovascular disease, stroke, nephropathy and kidney failure, retinopathy and blindness. report from the US Centers for Disease Control [CDC] recently estimated that a 10-year- old boy or girl developing [type 1] diabetes in the year 2000 would lose, on average, 18.7 and 19.0 life-years, respectively, compared with their non-diabetic peers".[12]

There is no known way to prevent or cure T1DM.

Type 1

ORIGINAL RESEARCH

Surrogate Indication of DNA Repair in Serum After Long Term Chiropractic Intervention – A Retrospective Study

Clayton J. Campbell[†], *Christopher Kent*[††], *Arthur Banne*[‡], *Amir Amiri*[‡], *and Ronald W. Pero*[‡‡]

ABSTRACT

Objective: To assess the effects of short-term and long-term chiropractic care on serum thiol levels in asymptomatic subjects.

Summary of background data: Serum thiols are a measure of human health status. It is a surrogate estimate of DNA repair enzyme activity, most notably poly ADP – ribose polymerase or PARP. While it is suggested that chiropractic care improves general health, the effect of chiropractic care on serum thiol levels has not been investigated.

Methods: A case controlled retrospective analysis. Serum thiol levels in patients with active disease (N=46) were compared with serum thiol levels in primary wellness subjects with 8-52 weeks of chiropractic care (N=21) and those who had been under chiropractic care for 52-312 weeks (N=25). Patients were age matched to be 40 years of age or older.

Results: There were statistically significant differences in the serum thiol levels of the three groups. Mean serum thiol levels were lowest in patients with active disease as well as patients with initial musculoskeletal complaints. Asymptomatic subjects under chiropractic care demonstrated higher mean serum thiol levels than patients with active disease. Mean serum thiol levels were highest in the group with 52-312 weeks of chiropractic care.

Conclusion: Asymptomatic or primary wellness subjects under chiropractic care demonstrated higher mean serum thiol levels than patients with active disease and produced some values that were higher than normal wellness values.

Keywords: *chiropractic, wellness, adjustment, thiol, DNA repair, oxidative stress*

Introduction

Alternative and complementary health care

Eisenberg et al[1] reported in 1993 that 34% of adults in the United States used at least one form of "unconventional" health care. Unconventional care was defined as those practices "neither taught widely in U.S. medical schools nor generally available in U.S. hospitals." Extrapolation of the survey indicated that the number of visits to alternative providers exceeded the number of visits to all U.S. primary care physicians.

A follow-up study[2] published in 2001 reported 67.6% of respondents had used at least one CAM (complementary and alternative) method in their lifetime. Lifetime use steadily increased with age across three age cohorts: approximately 3 of every 10 in the pre-baby boom cohort, 5 of 10 in the baby boom cohort, and 7 of 10 in the post-baby boom cohort reported using some form of CAM by age 33 years.

Chiropractic care

Chiropractic is the best established of the alternative health care professions, and it is now more than a century old. Chiropractic is a licensed healthcare profession in the United States, Canada and over 60 other countries worldwide.[3,4]

According to the Association of Chiropractic Colleges[5] "Chiropractic is concerned with the preservation and restoration of health, and focuses particular attention on the subluxation. A subluxation is a complex of functional and/or structural and/or

[†]Camgen, Inc., 101-4430 Chatterton Way, Victoria, B.C. V8X 5J2

Foundation for Vertebral Subluxation

Serum Thiol

- 46 Subjects
- Serum Thiol Levels Following Short & Long term care
- 2-868 weeks
- Network, Diversified & Activator
- Oxidative stress, free radicals, DNA repair
- Endogenous production of oxid. Stress
- Serum thiols are an estimate of mortality, longevity and active disease

Foundation for Vertebral Subluxation



First Documented Evidence of **Increased Telomere Length** Following Chiropractic

There is an old saying that chiropractic "adds life to years and years to life". Actually there are a lot of services and products that claim to do this.

In regards to chiropractic – one things is for sure: Research over the past 100 years has shown that chiropractic does indeed add "life" to years – meaning research has shown that chiropractic improves the quality of life in people who get chiropractic care.

In regards to the second claim of adding "years to life" there is a way to go in terms of research before such a statement can be made with certainty.

However, recent research reporting on a 35-year-old female undergoing chiropractic care showed that she experienced an increase in her ***telomere length*** following 5 months of chiropractic care. This is the first documented evidence showing increase in telomere length following chiropractic. The woman reported on in the study also experienced resolution of her neck and back pain as well as problems with frequent urination.

What does that have to do with life span you ask?

Telomeres are the caps at the end of each strand of DNA that protect our chromosomes (our genes), like the plastic tips at the end of shoelaces. Without the coating, shoelaces become frayed until they can no longer do their job. Without telomeres our DNA

JOURNAL OF THE ROYAL SOCIETY OF MEDICINE Volume 89 July 1996

The D_2 dopamine receptor gene as a determinant of reward deficiency syndrome

K Blum PhD[1,4,7] P J Sheridan PhD[2] R C Wood MPH[3] E R Braverman MD[4,7] T J H Chen PhD[5]
J G Cull PhD[6,7] D E Comings MD[7,8]

J R Soc Med 1996;**89**:396–400

SUMMARY

The dopaminergic system, and in particular the dopamine D_2 receptor, has been profoundly implicated in reward mechanisms in the brain. Dysfunction of the D_2 dopamine receptors leads to aberrant substance seeking behaviour (alcohol, drug, tobacco, and food) and other related behaviours (pathological gambling, Tourette's syndrome, and attention deficit hyperactivity disorder). We propose that variants of the D_2 dopamine receptor gene are important common genetic determinants of the 'reward deficiency syndrome'.

INTRODUCTION

After the finding by our laboratories of a strong association between the A_1 allele of the D_2 dopamine receptor gene and alcoholism[1], several groups were unable to replicate the observation[2–9]. We have suggested two possible reasons—first, inadequate screening of controls for alcohol, drug, and tobacco abuse; and, second, sampling errors in terms of characterization of alcoholics for chronicity and severity of the disease.

Here we review the evidence that the D_2 dopamine

A strong correlation between variants of the dopamine D_2 receptor gene and alcoholism and polysubstance abuse (including crack/cocaine) has been reported by several investigators[1,9,17–29].

In brain tissue obtained from patients carrying the A_1, B_1, and intron[6]-exon[7] haplotypes of the DRD_2 gene dopamine D_2 receptor densities are low[10,25,30]. Similarly, DRD_2 densities have been found lower in alcohol-preferring rodents than in alcohol-non-preferring animals[31–33]. Moreover, D_2 receptor agonists reduce, and D_2 receptor agonists



Three arm randomized clinical trial with two control groups

Residential addiction treatment setting.

A total of 98 subjects (14 female and 84 male) were enrolled in the year and a half study.

100% of the Active (chiropractic) group completed the 30-day program, while only 24 (75%) of the Placebo group and 19 (56%) of the Usual Care group completed 30 days.

Decreased anxiety and depression

Decreased nursing station visits.

Poor performance by the placebo group suggests that the chiropractic care had no positive placebo effect.

Palmer, B.J.: The Science of Chiropractic. 1920

"The mind, soul, spirit, nature, intuition, subconscious mind, or as I prefer to name it, the Innate Intelligence, which Dr. Carver refers to, runs the human machine, performs all functions in a natural manner, providing it is in proper order."



Pert, C. The Neuropeptide Network. New York Academy of Sciences. 1988

"The amygdala and hypothalamus are two such nodal points, of course. Moreover, they are particularly rich areas, because they contain receptors for essentially every neuropeptide we so far have identified. If our reasoning is correct - that the presence of a heavy density of neuropeptide receptors identifies a part of the **limbic** system - our research suggests that the ***usual picture of the limbic system should be extended to include the spinal cord, for a third area enriched with neuropeptide receptors is the dorsal horn of the spinal cord."***



Pert, C. The Neuropeptide Network. New York Academy of Sciences. 1988



"It was Freud, of course, who drew our attention to the possibility that the brain has a conscious part and an unconscious or subconscious part. Normally, one thinks of the conscious part on the top and the unconscious part toward the back. But we would go further **'back'** (or **down**) and say that the subconscious is in the spinal cord and even **'lower.'** Psychologists talk about deep subconscious processes. Clearly, the network of chemicals that I have attempted to describe suggests that the subconscious extends to one's T-cells, to one's monocytes, and in a kind of flowing wave, back to one's brain cells."

ORIGINAL RESEARCH

A Retrospective Assessment of Network Care Using a Survey of Self-Rated Health, Wellness and Quality of Life.

Robert H. I. Blanks, Ph.D.[1,2]
Tonya L. Schuster, Ph.D.[3] *Marnie Dobson, B.A.*[1]

Abstract — The present study represents a retrospective characterization of Network Care, a health care discipline within the subluxation-based chiropractic model. Data were obtained from 156 Network offices (49% practitioner participation rate) in the United States, Canada, Australia, and Puerto Rico. Sociodemographic characterization of 2818 respondents, representing a 67-71% response rate, revealed a population predominately white, female, well-educated, professional, or white collar workers. A second objective of the study included the development and initial validation of a new health survey instrument. The instrument was specifically designed to assess wellness through patients' self-rating different health domains and overall quality of life at two "time" points: "presently" and retrospectively, recalling their status before initiating care ("before Network"). Statistical evaluation employing Chronbach's alpha and theta coefficients derived from principle components factor analyses, indicated a high level of internal reliability in regard to the survey instrument, as well as stable reliability of the retrospective recall method of self-rated perceptions of change as a function of duration of care. Results indicated that patients reported significant, positive perceived change ($p < 0.000$) in all four domains of health, as well as overall quality of life. Effect sizes for these difference scores were all large (>0.9). Wellness was assessed by summing the scores for the four health domains into a *combined wellness scale*, and comparing this combined scale "presently" and "before Network." The difference, or "wellness coefficient" spanning a range of -1 to +1, with zero representing no change, showed positive, progressive increases over the duration of care intervals ranging from 1-3 months to over three years. The evidence of improved health in the four domains (physical state, mental/emotional state, stress evaluation, life enjoyment), overall quality of life from a standardized index, and the "wellness coefficient," suggests that Network Care is associated with significant benefits. These benefits are evident from as early as 1-3 months under care, and appear to show continuing clinical improvements in the duration of care intervals studied, with no indication of a maximum clinical benefit. These findings are being further evaluated through longitudinal studies of current populations under care in combination with investigation of the neurophysiological mechanisms underlying its effects.

Key Words: Network spinal analysis, vertebral subluxation, chiropractic, self-rated outcomes assessment, wellness, overall quality of life.

Introduction

Network Care is a health care discipline within the subluxation-based chiropractic model[1] practiced by members of the Association for Network Chiropractic (ANC), nationally and internationally. Building from a base of consistent clinical observations, and repeated anecdotal reports of health benefits, the present study was conducted to fulfill the following three objectives: (1) to characterize the patient population undergoing Network Care; (2) to develop a new survey instrument of sufficient design and scope to allow assessment of a non-medical health discipline, and (3) to assess changes in patients' self-rated health, wellness, and overall quality of life.

Network Care is founded on the premise that individuals free of the complex of factors precipitating from, or leading to, vertebral subluxation experience a greater range of inherent adaptability and, hence, a greater sense of relative health or wellness. In a large percentage of individuals, Network Care evokes spontaneous self-perpetuating contractions of the paraspinal musculature.[1] The movements may be subtle, barely perceptible, or very

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Foundation for Vertebral Subluxation

Blanks et al.

J. Vert. Subluxation. Res. 1997

1. **Largest study ever conducted in the history of the chiropractic profession**
2. **Involved 2818 patients and over 150 chiropractic offices in four countries.**
3. **Care intervals studied were from 1-3 months to over three years making it the longest study ever conducted.**
4. **Most significant, is that the benefits of chiropractic care (improved physical and mental health) were evident from as early as one month and showed continuing clinical improvements over three years with "no indication of a maximum clinical benefit."**

Foundation for Vertebral Subluxation

How tall does a tree grow?

Blanks et al.

Journal of Alternative and Complementary Medicine

Explored the dynamic between wellness, health lifestyle practices and chiropractic.

2596 patients

Conclusion: Patients under chiropractic care tended toward practices associated with a positive health lifestyle which further led to reported improvements in physical and mental wellness.

Foundation for Vertebral Subluxation



From the beginning . . .

Relation of disturbances of craniosacral mechanisms to symptomatology of the newborn: Study of 1,250 infants

VIOLA FRYMANN, M.B., B.S., D.O., F.A.A.O.
La Jolla, California

This study explores the possibility of a relation between symptomatology in newborn infants and anatomic-physiologic disturbances of the craniosacral mechanism. The primary respiratory mechanism hypothesis postulates a rhythmic cranial motion, palpable externally, that is the combined effect of the inherent motility of the central nervous system, fluctuation of the cerebrospinal fluid, the reciprocal tension mechanism of the dural membranes and their folds, and articular mobility of the cranial bones and of the sacrum between the ilia. Labor apparently has a traumatic effect on the craniosacral mechanism in some circumstances. Strain patterns within the developmental parts of the occiput appear significant in producing nervous symptoms. Flexion strain at the sphenobasilar symphysis, sacral extension strain, and compression of the sphenobasilar symphysis were noted in nervous infants. A significant relation is suggested between torsion strain of the sphenobasilar symphysis with restriction in temporal mobility and respiratory and circulatory symptoms.

The full-term skull is designed to provide the maximum accommodation to the forces of labor, the minimum trauma to the delicate nervous system within, and the utmost capacity for restitution after labor is complete.

At the time of birth ossification of the skull bones is not complete: the occipital, temporal bones, sphenoid, frontal bone, and mandible consist of more than one piece. Each portion of these bones may be regarded functionally as a separate bone, capable of moving in relation to its neighbor both physiologically in response to the forces from within the cranium and pathologically as a result of trauma from without. A thorough knowledge of the anatomy involved is essential to an understanding of the symptomatology which may result from a particular strain pattern. It will, moreover, direct the physician toward the prime cause behind a presenting symptom.

Time does not permit a detailed consideration of all these important areas. Only the highlights will be considered here.

Anatomic and physiologic considerations[1]

The *occipital bone* at birth is in four parts: the basilar part, two lateral condylar parts, and the squama which is formed by the union, during the third fetal month, of the interparietal occiput formed in membrane and the supraocciput formed in cartilage. These four parts form the anterior, lateral, and posterior margins of the foramen magnum respectively. Distortion of their mutual relationships may and frequently does distort the foramen magnum (Figs. 1-6). The hypoglossal nerve passes through the cartilage between the basilar part and the lateral or condylar part (Figs. 2, 3, 5). The hypoglossal is the motor nerve to the tongue and its physiologic function is of primary importance to the sucking and swallowing mechanism. Immediately anterolateral to the

1250 newborn infants

17% of them had occipital “strains”

Blocked Atlantal Nerve Syndrome
In Infants and Small Children

BY G. GUTMANN

(Published in "Manuelle Medizin" © Springer-Verlag 1987. The "ICA Review" thanks the Barge Chiropractic Clinic of LaCrosse, Wisconsin, for having the original paper translated into English by Ronald M. Mazur, PhD; Winona State University, Minnesota. Translation published with permission of "Manuelle Medizen" publishers.)

Summary: Three case reports are reviewed to illustrate a syndrome that has so far received far too little attention, which is caused and perpetuated in infants and small children by blocked nerve impulses at the atlas. The clinical picture ranges from central motor impairment and development through idencephalic impairments of vegetative regulatory systems to lowered resistance to infections, especially to ear-, nose- and throat-infections. The theoretical background to this syndrome is indicated. The main factor in the causation concerns the neurophysiological connections between the area of the atlanto-occipital joint and centers in the brain stem. In addition to the case history (birth trauma, etc.) and the pediatrician's diagnosis, chiropractical and radiological examination are of decisive importance for the diagnosis of this syndrome. If the indications are correctly observed, chiropractic can often bring about amazingly successful results, because the therapy is a causal one.

Key words: Babies, infants, atlas, blocked nerves, dysregulation, motor, vegetative, impaired development, resistance lowered to infections, diagnosis and therapy, chiropractical.

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We described this syndrome for the first time in 1953, and then again in 1968, with the complex designation, cervical-diencephalic-static syndrome (C.D.S.). In 1984 we described it as cervical-diencephalic-kinesiological syndrome in small children.

Even though it is among the most satisfying indications of the effectiveness of manual therapy, evidently even experts in our own ranks have hardly gained access to this occurrence at all. Only the pediatrician Mohr (30) has checked our reports and confirmed them in full measure. Lewit, (26, 27) and later Seifert (35) expressed a similar opinion in the German Democratic Republic.

CASE STUDIES

V.S., 10-month-old male child
Congenital torticollis after suction-belljar delivery. Post-natal haemotoma of the sternocleidic mastoid on the right side.

In spite of intensive therapeutic gymnastics, no improvement in the torticollis. A clear-cut asymmetry had developed in the skull and face. Crawling, let alone sitting, was impossible. The orthopedic institute treating the patient diagnosed cerebral disturbances of movement.

Our X-ray findings: Moderate degree of inferior location of the atlas with kyphotic position of the HWS and dislocation of the occiput (al) on the right side across from Cl and C2.

No clear blockage could be felt manually. Targeted manual impulse treatment (Cl/C2 from the left with counter-support of the occiput (al).) In the course of the next 12 months, the first clear improvement in posture and motor responses, confirmed by colleagues collaborating in the treatment.

The second treatment was after 4 months. The parents reported that the child had literally made a great leap forward after each treatment.

Later reports from the parents and treating doctors confirmed unanimously that both motor responses and the previously retarded mental and linguistic development were now pro-

Blocked Atlantal Nerve Syndrome

Gutmann found that these infants suffered from lowered resistance to infections, especially to ear-nose- and throat infections, insomnia, cranial bone asymmetry, torticollis, walking problems, language delays, conjunctivitis, tonsillitis, rhinitis, earaches, extreme neck sensitivity, scoliosis, delayed hip development, and seizures.

Incidence of Somatic Dysfunction in Healthy Newborns

Erica L. Waddington, DO; Karen T. Snider, DO; Michael D. Lockwood, DO; and Vanessa K. Pazdernik, MS

From Tri Town Community Action Agency, Alpert School of Medicine at Brown University in Johnston, Rhode Island (Dr Waddington); the Department of Family Medicine, Preventive Medicine and Community Health at the A.T. Still University–Kirksville College of Osteopathic Medicine in Missouri (Dr Snider); the Liberty University College of Osteopathic Medicine in Lynchburg, Virginia (Dr Lockwood); and Research Support at A.T. Still University in Mesa, Arizona (Ms Pazdernik).

Financial Disclosures: None reported.

Support: None reported.

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E-mail: ksnider@atsu.edu

Submitted September 3, 2014; final revision received May 26, 2015; accepted June 24, 2015.

Context: Recent evidence suggests that osteopathic manipulative treatment of somatic dysfunction in newborns may decrease complications and hospital length of stay. Such dysfunction may result from external forces related to the birth process, but its incidence is unknown.

Objective: To identify the incidence and patterns of somatic dysfunction in healthy newborns at least 6 hours after birth and to correlate those findings with maternal and labor history, gestational age, and findings of the initial newborn assessment performed immediately after birth.

Methods: Healthy newborns aged 6 to 72 hours were physically examined and assessed for somatic dysfunction, including asymmetry and motion restriction of the cranial, cervical, lumbar, and sacral regions. The total somatic dysfunction identified was summarized in a somatic dysfunction severity score (SDSS), calculated by assigning 1 point for each identified finding; the SDSS could range from 0 (no somatic dysfunction) to 34 (all somatic dysfunctions assessed present). Findings were correlated with maternal and newborn characteristics and labor history. Descriptive analyses were performed, and findings were compared between the initial newborn assessment and the research examination.

Results: One hundred newborns were examined (mean gestational age, 38.5 weeks). In 99 newborns (99%), at least 1 sphenobasilar synchondrosis strain pattern was present, with sidebending rotations being the most common (present in 63 newborns [63%]). Condylar compression was found in 95 newborns (95%), temporal bone restrictions in 85 (85%), motion restriction of at least 1 cervical vertebral segment in 91 (91%) and at least 1 lumbar vertebral segment in 94 (94%), and a posterior sacral base in 80 (80%). The SDSS was not associated with mode of delivery or labor augmentation (P=.49 and P=.54, respectively), but it was positively associated with the duration of labor; each 1-hour increase in labor increased the predicted SDSS by 0.12 points (P=.04).

Conclusion: Somatic dysfunction of the cranial, cervical, lumbar, and sacral regions was common in healthy newborns, and the total somatic dysfunction (SDSS) was related to the length of labor. (ClinicalTrials.gov number NCT01496872)

J Am Osteopath Assoc. 2015;115(11):654-665
doi:10.7556/jaoa.2015.136

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100 Newborns

Somatic dysfunctions

Extremely common in newborns.

Examined “healthy” newborns 6 to 72 hours old

99% of them had somatic dysfunction

Severity was related to the length of labor.

Siefert studied over 1000 infants and found that 11% of them suffered from subluxations in the upper neck and they also had scoliotic (curved) postures.

What makes Siefert's study so important is that none of those infants had any symptoms whatsoever.

J Manual Medicine (1992) 6:151–156

Journal of Manual Medicine
© Springer-Verlag 1992

Kinematic imbalances due to suboccipital strain in newborns

H. Biedermann

Surgical Department, University of Witten-Herdecke, Schützenstrasse 9, W-5840 Schwerte, Federal Republic of Germany

Summary. Using case histories and catamneses, the pathogenetic potential of the craniovertebral junction in newborn and young children is discussed. Supporting neurophysiological findings are presented. The symptom complex of "kinematic imbalances due to suboccipital strain" (KISS syndrome) has a wide range of clinical signs and can in many cases be dealt with effectively by manual therapy. The main symptoms are torticollis, unilateral microsomy, C-scoliosis and motoric asymmetries, often accompanied by unilaterally retarded maturation of the hip joints and slowed motor development. Risk factors seem to be: intrauterine misalignment, application of extraction aids, prolonged labor and mulitple fetuses.

Key words: Manual therapy – Craniovertebral junction – Cervical spine – C-scoliosis – Motor asymmetry – Torticollis

The pathogenetic importance of asymmetric posture and motion in small children is often played down if recognized at all. Quite regularly, parents complaining about the bent position of their baby get the advice "to cantilever the baby during sleep, and it will go away"; this proves to be wrong in many cases. Vojta and Bobath went beyond the mere diagnostic description of "C-scoliosis" or "torticollis" and developed treatment schemes based on refined methods of examination and a deeper understanding of neuromotor development. These forms of therapy were developed for children with minimal cerebral damage (MCD) and greatly improved the changes of rehabilitation in these little patients. Both methods require a lot of discipline from parents and physiotherapists alike. In many cases the duration of the treatment can be shortened by combining and/or replacing it with manual therapy of the suboccipital segments of the upper cervical spine.

Patients and methods

Patients

Of the more than 600 children (age ≤24 months) treated to date, we chose a group of 135 babies referred to us by a pediatric orthopedist between 1981 and 1990; 114 of them could be reached for follow-up.

Most of the babies were refered to us because of asymmetric posture. The case histories included the following (Table 1):

- Tilt posture of the head, torticollis.
- Opisthotonos, head held in retroflexion. Unable to lie on the back, as this forces the head into anteflexion.
- Uniform sleeping posture; the child cries if the mother tries to change its position.
- Asymmetric motor patterns.
- Asymmetric posture of trunk and extremities, sometimes combined with a tilted head position reminiscent of a persisting asymmetric tonic neck reflex.
- Sleeping disorders; the baby wakes up crying every hour.
- Extreme sensitivity of the neck.
- Cranial scoliosis, swelling of one side of the facial soft tissues.
- Blockages of the iliosacral points, asymmetries of the gluteis muscles.
- Asymmetric development and range of movement of the hips.
- Fever of unknown origin; loss of appetite and other symptoms of central nervous system disorders.

Needless to say, these symptoms cover a wide range of pathological conditions and cannot always be attributed to the suboccipital joints, but if we encounter a combination of motor asymmetries, sleeping disorders and a facial scoliosis, it is worthwile to look at the suboccipital joints.

Table 1. Findings at first examination

	KISS
Mobility of the cervial spine reduced more than 30%[a]	85 (74.6%)
Torticollis	44 (38.6%)
C-scoliosis	40 (35.1%)
Unilateral microsomy	47 (41.2%)
Retarded development of the hip joints (sonographically verified)	50 (43.9%)
Opisthotonos	11 (9.7%)
Mobility of the vertebral spine reduced more than 30%	12 (10.5%)
Feet deformities	12 (10.5%)
Pathological reflexes[b]	3.2 of 7

[a] Including cases of torticollis
[b] Tested: Vojta, traction test; Peiper, Collis, vertical and horizontal; Landau, axiallary hanging test (see [37])

600 children less than two years old.

"suboccipital strain"

This area can literally be a **chokepoint.**

Biedermann found the infants and children effected by these subluxations in the neck experienced **birth trauma, prolonged labor and the use of things like forceps** during their births

Number one thing that brought these infants into Biedermann's clinic: **Asymmetric posture**.

Tilted head, the head held backwards, awkward sleeping positions, movements on one side of the body that don't match the other side, sleeping disorders, extreme sensitivity, swelling of one side of the face, abnormalities of the hips and spine, unexplained fevers, loss of appetite.

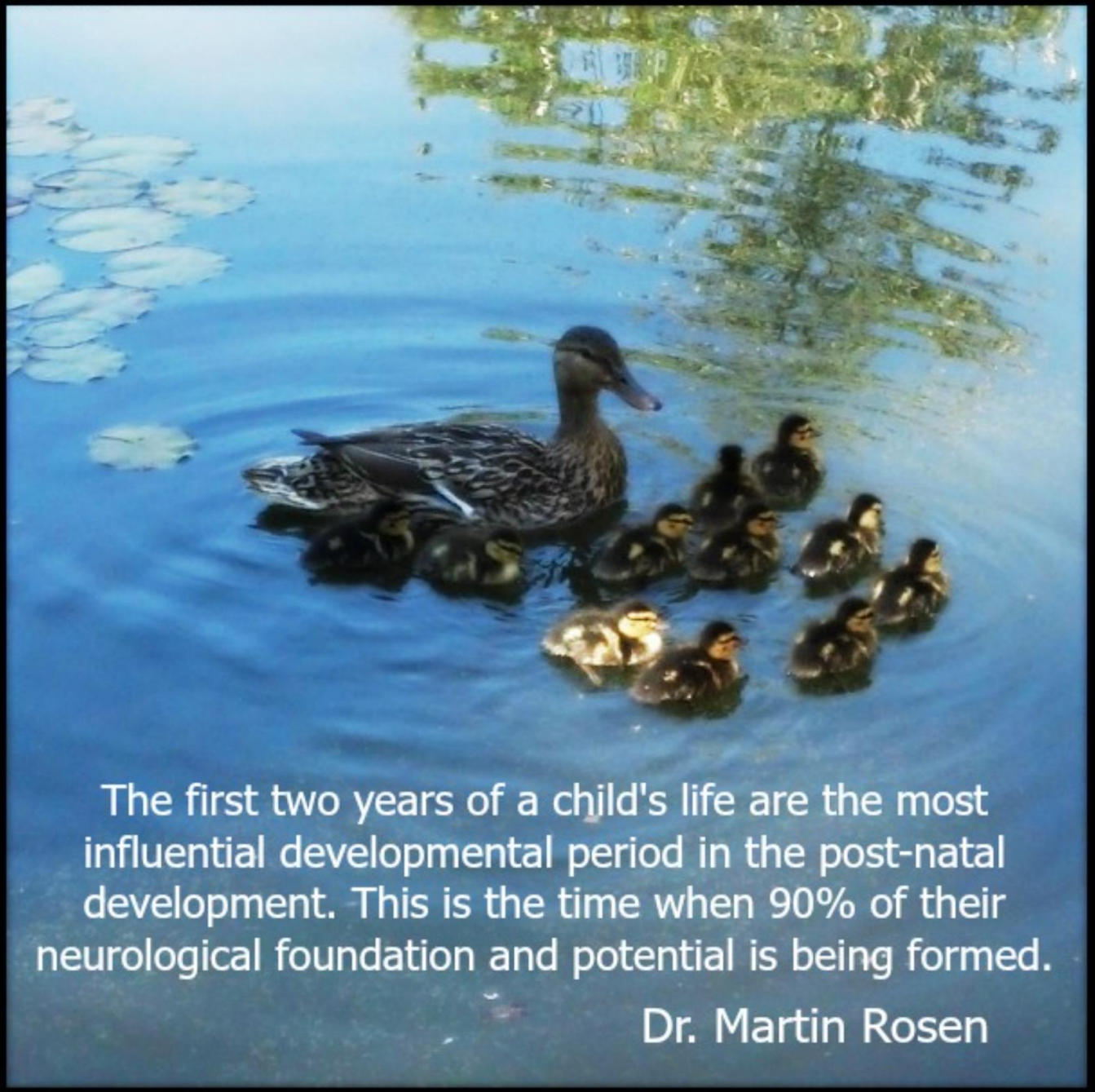
Biedermann found that their necks were stiff, had reduced range of motion, one side of the head sometimes larger than the other, abnormal reflexes, muscle spasms of the back so severe that the infants' backs were arched

Biedermann **took x-rays** which he used to help determine how to fix the misalignments

Biedermann

"The birth canal is one of the most dangerous obstacles we ever have to traverse."

drmartinrosen.com





Australian Chiropractic Board BANS Spinal Manipulation in Infants

Thursday, March 14, 2019 - 11:39

NEWS STAFF



Interim Policy in Place Until Government Investigation is Over

In a shocking and unprecedented move, the **Chiropractic Board of Australia has banned the practice of spinal manipulation in children by chiropractors**. The move comes after calls from the Victorian Health Minister and Australian Medical Association's President to stop the chiropractic care of children.

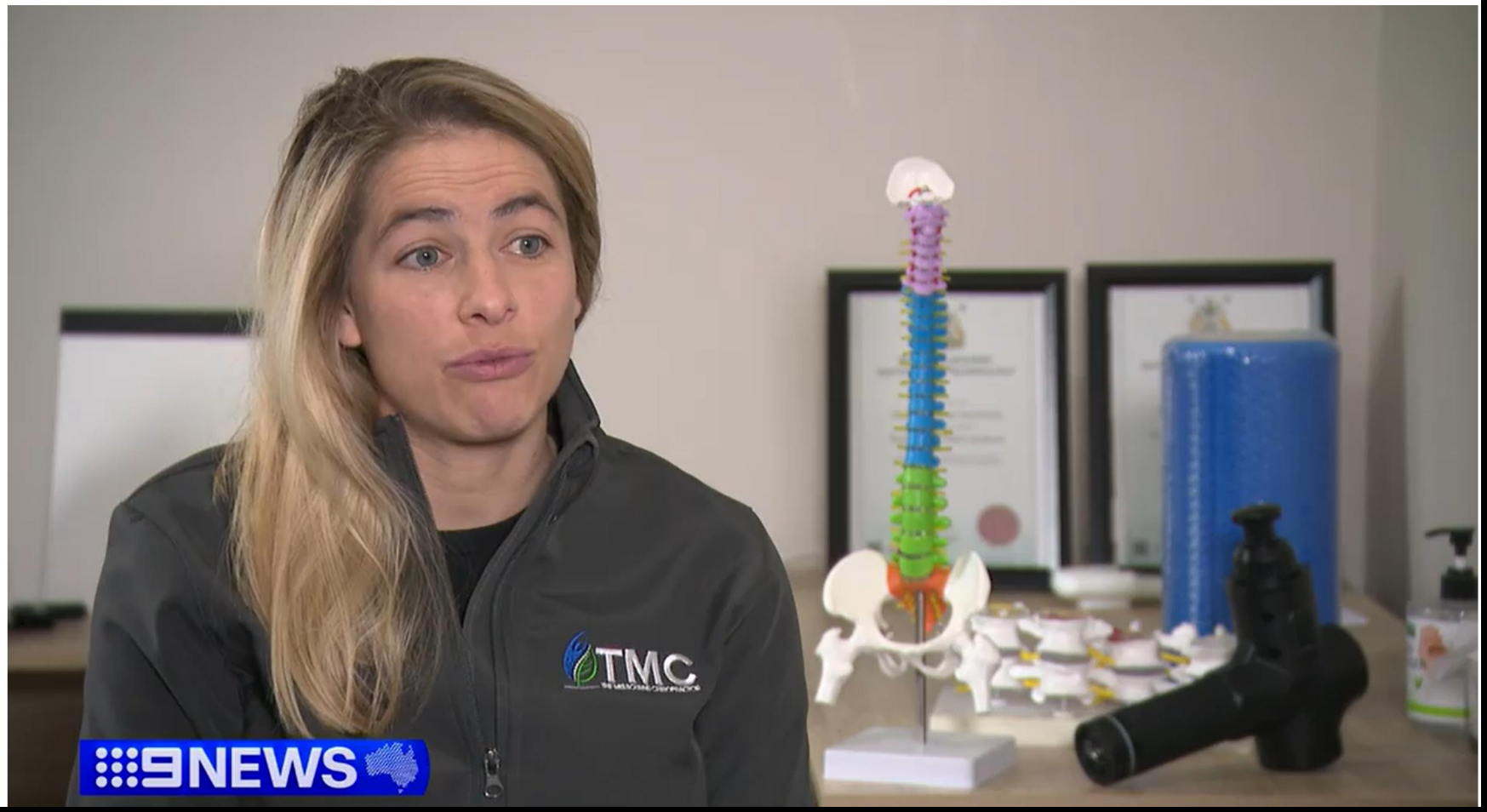
CLICK HERE to review the policy

Incredibly, the Chiropractic Board either lies in their announcement or reveals deep seated ignorance stating:

". . . the Board acknowledges there is no current clinical guideline, or peer-reviewed publication to guide chiropractors with respect to the care of infants and young children, and the use of spinal manipulation in particular."

GPs call for infant spinal adjustments to be outlawed after interim ban ends

By 9News Staff | 8:10pm Jun 13, 2024



"We treat specifically colic, reflux constipation, and different problems with sleep"

Chiropractic Board reinstates interim policy

News

Newsletters

Media releases

Professional practice issues

Current consultations

Past consultations

Communiques

17 Jun 2024

The Chiropractic Board of Australia has reinstated an interim policy on the spinal manipulation of children under two years of age, pending further consultation with Australia's health ministers.

This follows a request from the Health Ministers Meeting on 14 June.

Board Chair Dr Wayne Minter AM said the Board expects chiropractors to comply with the interim policy, which advises chiropractors to not use spinal manipulation to treat children under two years of age, until further consultation with Health Ministers can allow for developing a final position.

'While there has been no evidence of serious harm to infants from chiropractic care in Australia, the Board's role is first and foremost to protect the public.

'We look forward to working with Ministers to develop an evidence-based final policy on paediatric care that balances the paramount need to protect patients, with the right for parents and other patients to have a say in the care they choose,' Dr Minter said.

The Board first released an interim policy on the spinal manipulation of children under 12 years of age in 2019 while evidence about its safety and effectiveness could be gathered. After commissioning Cochrane Australia to provide an updated systematic review of the effectiveness and safety of spinal manipulation in children

Chiropractic Board of Australia reinstates ban on baby back cracking



By Jorge Branco | 12:05am Jun 18, 2024



MEDIA RELEASE

AUSTRALIAN CHIROPRACTORS ASSOCIATION

FOR IMMEDIATE DISTRIBUTION

Thursday 13 June 2024

99.6% of Australian parents affirmed chiropractic healthcare benefitted their child

Today, the Australian Chiropractors Association (ACA) president, Dr David Cahill (chiropractor) welcomed the updated statement on paediatric care by the Chiropractic Board of Australia.

"The statement serves to reinforce the confidence the Australian public has in chiropractic care provided by registered ACA member chiropractors," said Dr Cahill.

The Safer Care Victoria Review has shown chiropractic care for children to be extremely safe.

Of the 29,599 online submissions received from across Australia (the largest survey of its kind), there were no reports of harm to a child receiving chiropractic healthcare.

Of those submissions, 21,824 responses were from parents who had accessed chiropractic healthcare for their children, and there was not a single report of significant harm in these submissions.

"In a particularly strong endorsement, 99.6% of those parental submissions affirmed that chiropractic healthcare benefitted their child highlighting the exemplary safety record of chiropractic healthcare," Dr Cahill said.

ACA member chiropractors are healthcare professionals who effectively treat a wide range of musculoskeletal disorders.

Chiropractors are 5-year university degree educated healthcare professionals, equipped with expertise enabling them to tailor the appropriate care for people of all ages including children.

Established in 1938, the Australian Chiropractors Association (ACA) is the peak body representing chiropractors.

The ACA promotes the importance of maintaining spinal health to improve musculoskeletal health through non-invasive, drug-free spinal health and lifestyle advice to help Australians of all ages lead and maintain healthy lives.

-ENDS-

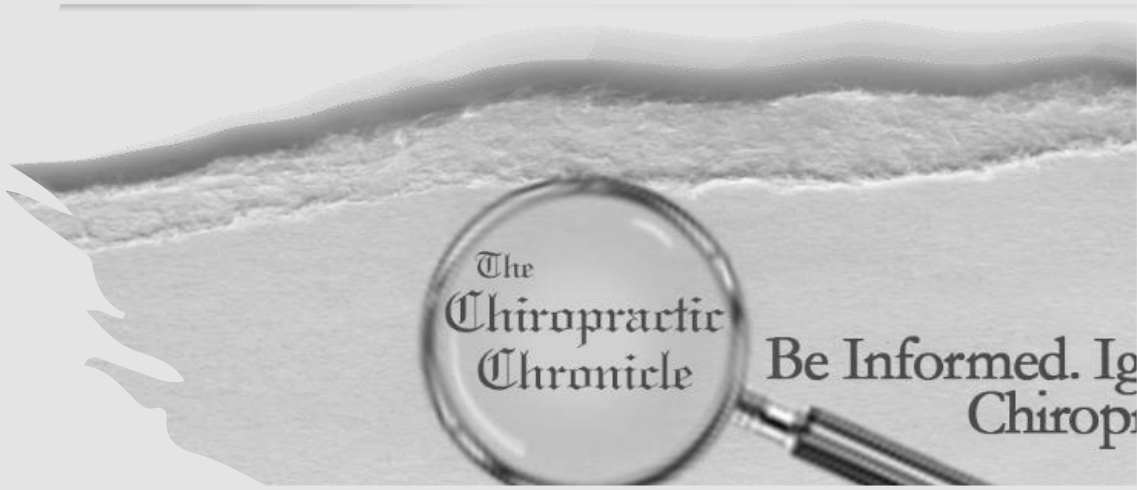
INTERVIEW REQUESTS
Contact Insight Communications: 02 9518 4744
Alice Collins M: **0414 686 091** E: alice@insightcommunications.net.au
Clare Collins M: **0414 821 957** E: clare@insightcommunications.net.au

insight communications

“The idea that children should now be subject to spinal manipulation … is quite scary”



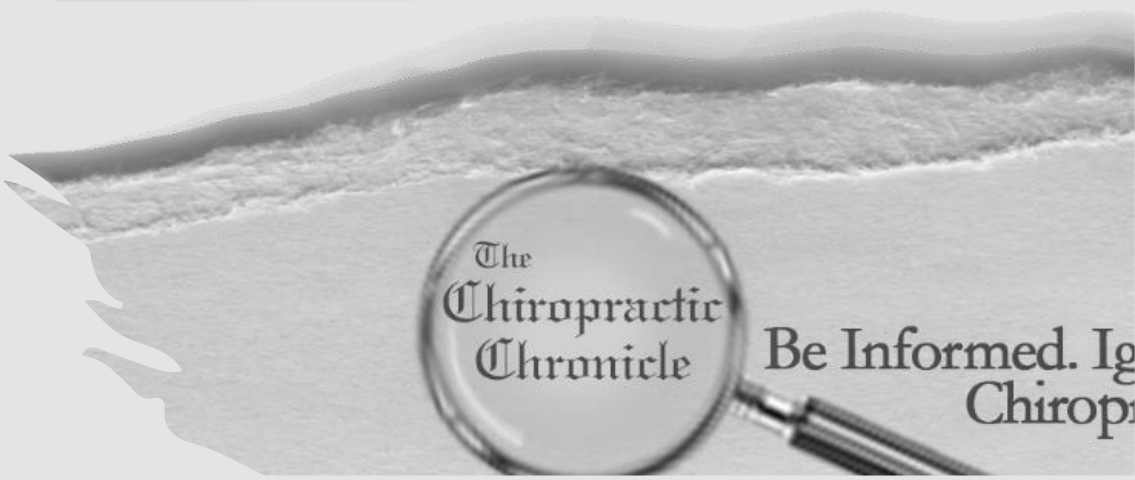
Michael Clements
Vice-President of the Royal Australian College of General Practitioners



"We know there is a risk of harm; we know that there is no evidence of a curative benefit or that these therapies are needed."

— Associate Professor Michael Clements, Vice President of the Royal Australian College of General Practitioners (RACGP) on the chiropractic infant ban.

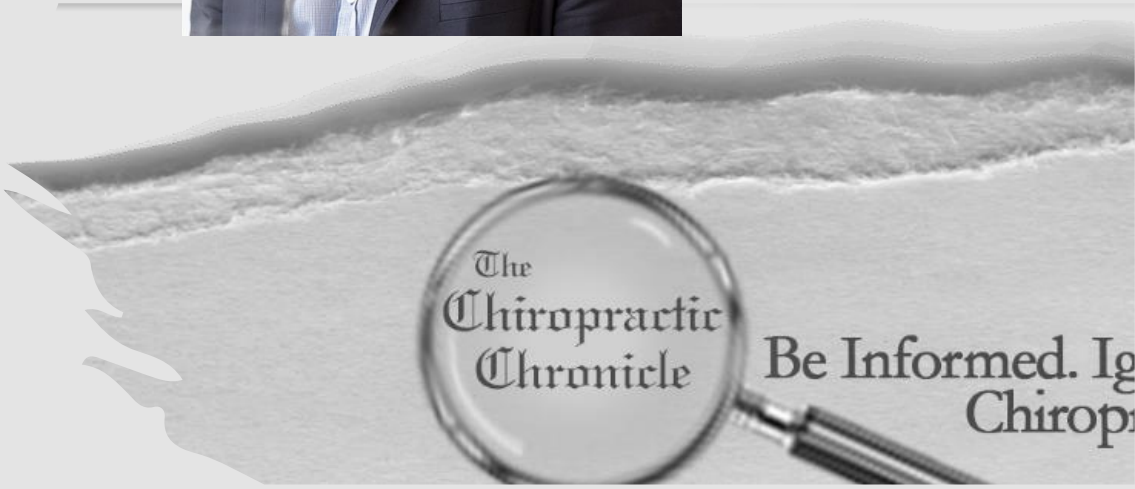




"The child is an immature structure; they're not fully grown humans yet so everything that you do to them puts them at risk for the future."

— Dr. Patrick Lo, Paediatric Neurosurgeon on the chiropractic infant ban

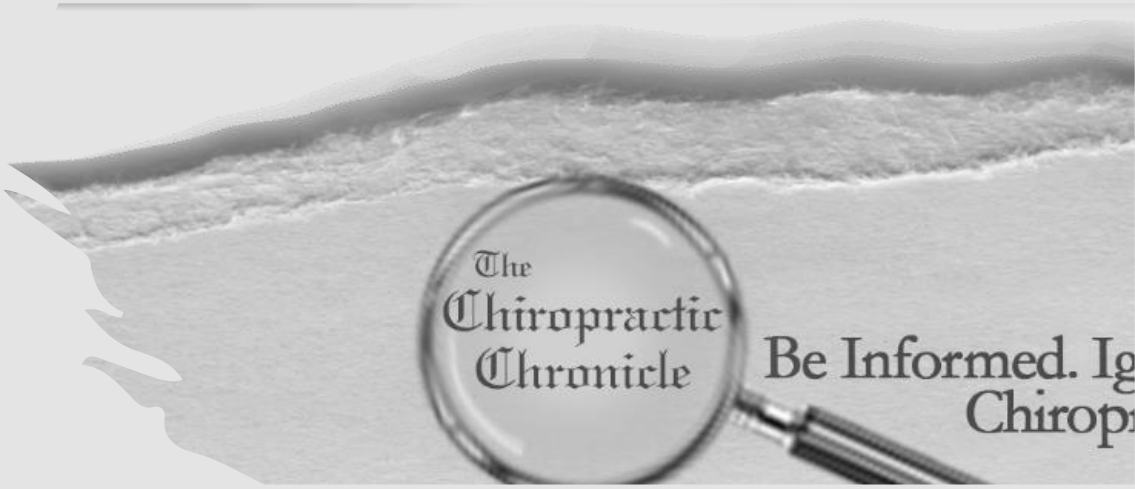




"Reinstating spinal manipulation of babies is reckless"



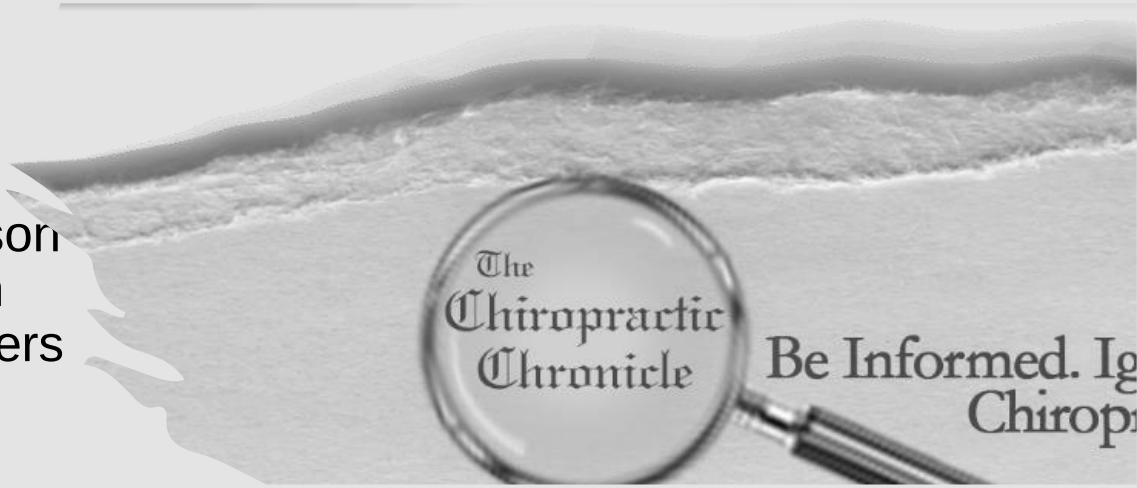
— James Best
Chair of child and young person health at the Royal Australian College of General Practitioners



"The spinal columns of young children and babies are really susceptible to injuries."

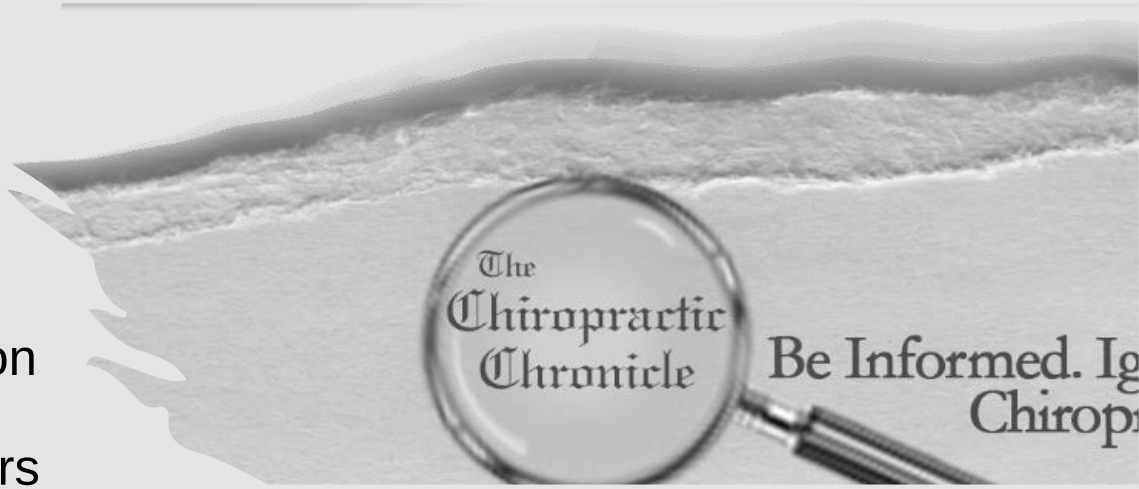


— James Best
Chair of child and young person
health at the Royal Australian
College of General Practitioners



"It's certainly something I wouldn't do to my child, so I would advise parents to not allow this sort of practice to be done to your child.



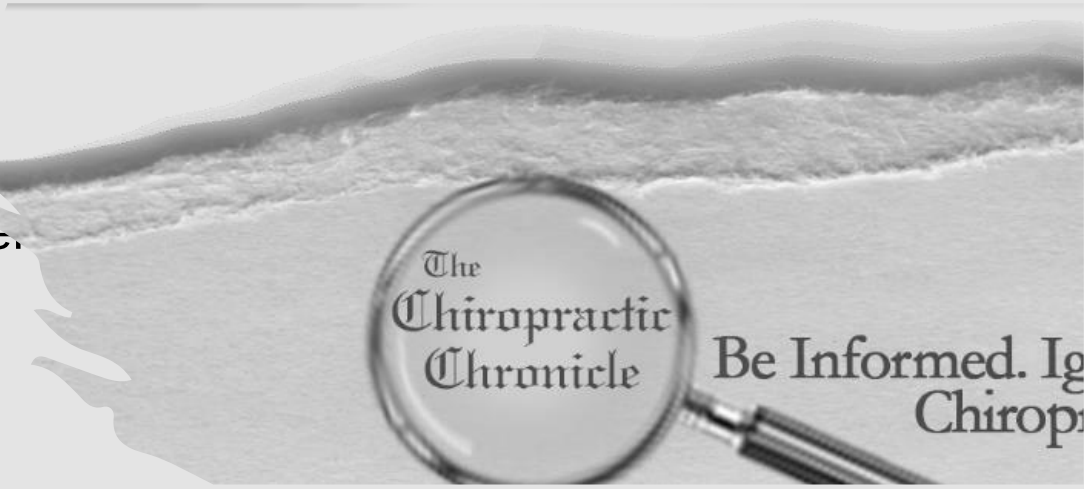


— James Best
Chair of child and young person health at the Royal Australian College of General Practitioners

The practice is "deeply disturbing".



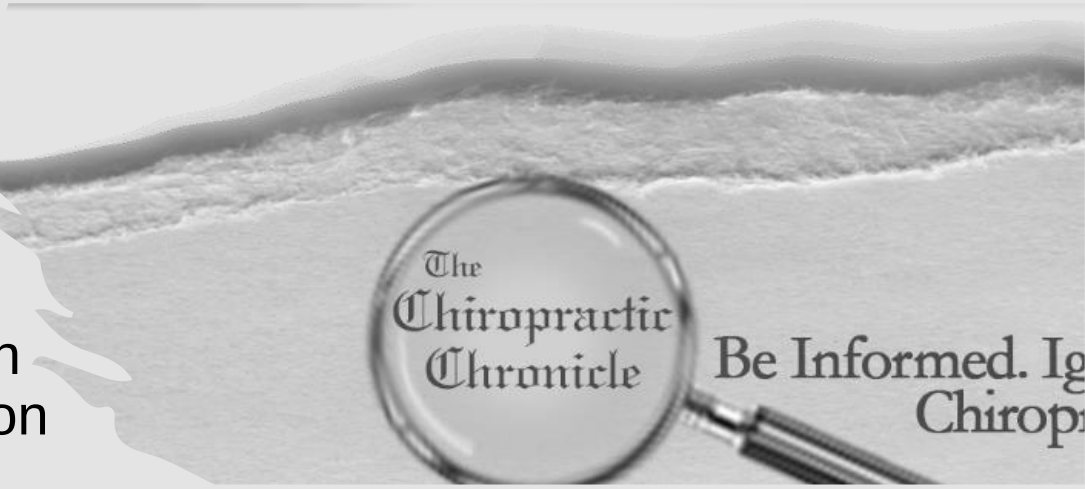
— James Best
Chair of child and young person health at the Royal Australian College of General Practitioners on the chiropractic care of childre



"Chiropractic treatments are largely unstudied and any treatment for children should be evidence based. The ban should remain in place until we get full evidence one way or the other"

Australian Medical Association federal president Steve Robson

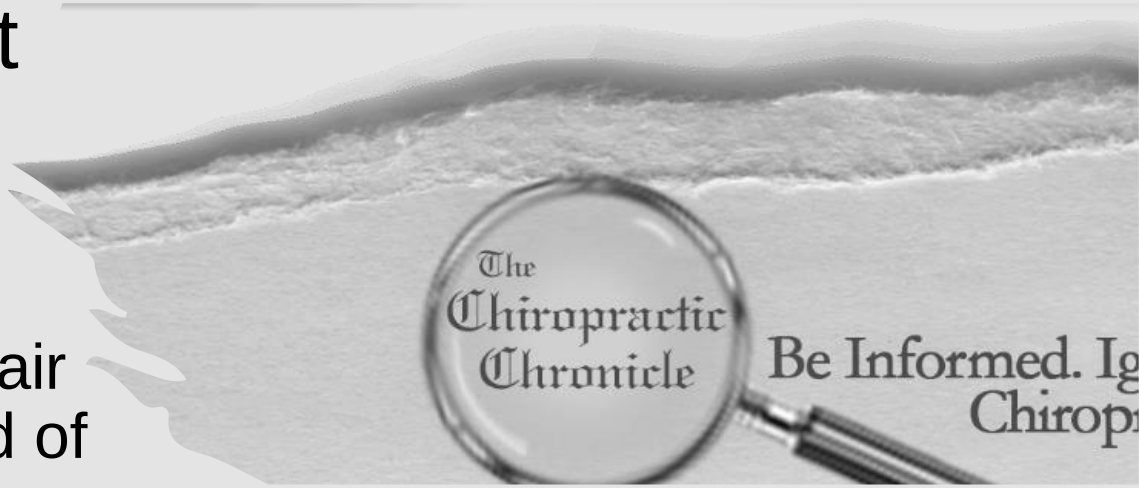




"While there has been no evidence of serious harm to infants from chiropractic care in Australia, the Board's role is first and foremost to protect the public."

— Dr. Wayne Minter, Chair of the Chiropractic Board of Australia





Chiropractic Board of Australia

Advertising regulated health services

Inappropriate claims of benefit

Patients must be adequately informed when making health care choices. Advertisers must ensure that any statements and claims made in relation to chiropractic care are not false, misleading or deceptive or create an unreasonable expectation of beneficial treatment.

The Board is concerned about a number of practitioners who are making claims in advertising that there is a relationship between manual therapy (e.g. manipulation) for spinal problems and achieving general wellness or treating various organic diseases and infections; or that spinal problems may have a direct role in various organic diseases and infections. There is insufficient scientific evidence to support these claims.

Of particular concern is the number of treatment claims in advertising relating to infants and children. Claims suggesting that manual therapy for spinal problems can assist with general wellness and/or benefit a variety of paediatric syndromes and organic conditions are not supported by satisfactory evidence. This includes claims relating to developmental and behavioural disorders, ADHD, autistic spectrum disorders, asthma, infantile colic, bedwetting, ear infections and digestive problems.

Advertising claims that are contrary to high level evidence are unacceptable. High level evidence will usually take the form of meta-analyses, systematic reviews or one or more high quality and well respected and acknowledged studies.

The Board devoted its September 2015 newsletter to providing information to practitioners on advertising related matters and strongly encourages practitioners to review their advertising and ensure it complies with the requirements of the National Law or they risk prosecution and/or disciplinary action.

Appalling

"It's **appalling** that young children and infants are being exposed to potential harm. Newborn babies are extremely fragile and it's important to be aware that the damage done to an infant may not be obvious immediately and may not manifest until years later. The [CBA] **must condemn this practice** as unprofessional and unacceptable, and AHPRA must act quickly to **stop these rogue practitioners in their tracks**."



Victorian Health Minister Jenny Mikakos
Statement regarding chiropractic care of infants

SUBLUXATION DENIERS
SUBLUXATIONDENIERS.COM

Dangerous Practice

"There is no credible evidence for this [chiropractic], it is a dangerous practice in itself and it potentially impedes the proper assessment and management of an infant."

Julian Rait MD
President – Australian Medical Association
June 21, 2019

SUBLUXATION DENIERS
SUBLUXATIONDENIERS.COM

No Evidence

"There is **no evidence chiropractic care benefits babies** or can treat them for medical conditions and there is not enough evidence to suggest it [chiropractic] can achieve general wellness or treat various organic diseases and infections."

The Chiropractic Board of Australia
At-risk advertising by Australian chiropractors and physiotherapists
J. Keith Simpson. Chiropractic & Manual Therapies June 13, 2019 27:30

SUBLUXATION DENIERS
SUBLUXATIONDENIERS.COM

No Research

"The Board acknowledges there is no current clinical guideline, or peer-reviewed publication to guide chiropractors with respect to the care of infants and young children, and the use of spinal manipulation in particular"

Chiropractic Regulatory Board of Australia

SUBLUXATION DENIERS

SUBLUXATIONDENIERS.COM

Not Definitive

"Is the care likely to be effective or of benefit to young babies? Look, while there is some positive, moderate level of evidence, its not definitive at this stage. Certainly not at the level of evidence where we would feel confident advertising it on a website"

Anthony Coxon DC
President of the Australian Chiropractic Association

SUBLUXATION DENIERS
SUBLUXATIONDENIERS.COM

Birth Trauma

In Australia, the incidence of birth trauma varies depending on the criteria and definitions used. According to a study by the Australian Institute of Health and Welfare (AIHW), approximately 2-3% of live births involve some form of birth trauma. **This figure translates to around 6,000 to 9,000 newborns affected annually.** The prevalence of specific injuries, such as brachial plexus injuries, is estimated to be around 1-2 per 1,000 live births.



Economic Costs of Birth Trauma

- The economic burden of birth trauma is substantial, impacting both the healthcare system and families. Costs associated with birth trauma include immediate medical expenses, long-term healthcare needs, rehabilitation, and indirect costs such as lost productivity and the emotional toll on families.

- **Immediate Medical Costs:** These include costs related to neonatal intensive care, surgeries, and other medical interventions required to address the injuries. Neonatal intensive care unit (NICU) stays, in particular, can be extraordinarily expensive, with daily costs ranging from $2,000 to $5,000 per day, depending on the level of care required.

- **Long-Term Healthcare Costs:** Children who suffer from birth trauma often require ongoing medical treatment and rehabilitation. This can include physical therapy, occupational therapy, and in some cases, multiple surgeries over the years. Long-term care for conditions like cerebral palsy, which can result from severe birth trauma, can cost families and the healthcare system hundreds of thousands of dollars over a lifetime.

- **Indirect Costs:** These are more challenging to quantify but are equally significant. Parents of children with birth trauma may need to reduce working hours or leave their jobs to care for their child, leading to lost income. Additionally, the psychological impact on families can be profound, necessitating mental health support and counseling, which further adds to the economic burden.





Submission to the Safer Care Victoria

Independent Review | chiropractic spinal care for children under 12 years

June 2019

Our discussions with government and other stakeholders are not about philosophy, nor is philosophy central in our marketing and communications. **Professionalism and best outcomes for patients AND OUR PROFESSION IS OUR MANTRA.**

Anthony Coxon DC - ACA President

Statement on paediatric care

Codes and guidelines

Supervised practice framework

Advertising a regulated health service

Code of conduct

Guidelines for mandatory notifications

Position statements

Statement on paediatric care

Provision of health information

Background information: The advertising provisions of the National Law

29 November 2023

The Chiropractic Board of Australia

The role of the Chiropractic Board of Australia (the Board) is to protect the public in accordance with the Health Practitioner Regulation National Law (the National Law), as in force in each state and territory. The Board does this through its work in the National Registration and Accreditation Scheme (the National Scheme) in partnership with the Australian Health Practitioner Regulation Agency (Ahpra).

The core role of the Board and Ahpra is to protect the public. All chiropractors have a duty to make safe and effective patient care their primary concern.

The Board's position on paediatric care

The intent of this position statement is to clarify the Board's expectations regarding paediatric care by chiropractors.

The Board's position on paediatric care

The intent of this position statement is to clarify the Board's expectations regarding paediatric care by chiropractors.

Chiropractors receive extensive tertiary education and training to provide care across the lifespan.

In caring for children, chiropractors provide a range of treatment modalities that may include manual therapy such as mobilisation, soft tissue therapy, manipulation, and/or advice relating to exercise and other lifestyle factors relevant to the child's age, condition and concern.

Adjustment?

When chiropractors do not have the clinical skills and knowledge to appropriately assess or manage a paediatric patient, the Board expects them to refer the patient to another healthcare practitioner(s) who have the appropriate skills, or to co-manage the patient with the other healthcare practitioner(s).

What the Board expects

The Board's standards, codes and guidelines set out its expectations of practitioners in delivering effective healthcare within an ethical framework.

These include the:

- Code of conduct (2022) (the Code)
- Guidelines for advertising a health service (2021) (the Advertising guidelines) and
- Evidence-based practice fact sheet (2023).

While this *Statement on paediatric care* provides specific reference to relevant regulatory documents in the boxes below, the Board expects chiropractors to read and understand all registration standards, codes, guidelines, fact sheets and statements.

There are considerations, responsibilities and differences in the provision of care for children. The Board expects chiropractors to:

- understand that children have significant anatomical, physiological, developmental and psychological differences and needs from adults and that their healthcare management requires specific skills and expertise
- modify all care and treatment (including technique and force) to suit the age, presentation and development of the patient
- discuss their proposed management plan with the patient and their parent/guardian
- inform the patient and their parent/guardian about the quality of the acceptable evidence and explain the basis for the proposed treatment
- provide the patient and their parent/guardian with information about the risks and benefits of the proposed treatment and the risks of receiving no treatment Subluxation?
- appropriately document consent, including considering the need for written consent for high-risk procedures HVLA? Inversion?
- refer patients when they have conditions or symptoms outside a chiropractor's area of competence, for example 'red flags' such as the presence of possible serious pathology that requires urgent medical referral to the care of other registered health practitioners
- communicate effectively with other health practitioners involved with the care of the patient, such as the patient's general practitioner or paediatrician.

Best practice and evidence-based care

Best-practice approaches to providing chiropractic care to children are published in peer-reviewed literature. This evidence should be used to guide clinical practice and ensure chiropractors provide safe care. Current evidence indicates that the incidence of serious adverse events, either directly from manual therapy or indirectly by delayed referral or misdiagnosis, is very rare but can occur.

The Board expects chiropractors to make sure their clinical practice is consistent with current peer-reviewed evidence and/or best-practice approaches.

Where can you find more information in our regulatory documents?

Code of conduct

Principle 1 of the Board's Code of conduct says that practitioners should practise safely, effectively and in partnership with patients and colleagues, using patient-centered approaches, and informed by the best available evidence to achieve the best possible patient outcomes. Principle 11 outlines that practitioners should recognise the vital role of ethical and evidence-based research to inform quality healthcare.

The Code outlines in section 4.3 the Board's expectations on caring for children and young people, including that good chiropractic practice involves placing the interests and wellbeing of the child or young person first.

The Code also states in section 6.1 that good practice includes ensuring services provided are appropriate, necessary and likely to benefit the patient and requires practitioners in section 6.3 to understand and apply principles of public health and use the best available evidence in making practice decisions.

Guidelines for advertising a regulated health service

Section 4.1 of the Guidelines for advertising a regulated health service outlines how advertising may be false, misleading or deceptive including:

- when it makes statements about effectiveness of treatment that are not supported by acceptable evidence
- when it makes unqualified claims about the effectiveness of treatment by listing health conditions that a treatment or service can 'assist with' or treat.

Evidence-based practice fact sheet

The Board's Evidence-based practice fact sheet advises that evidence-based practice involves a practitioner considering the available research and other sources of information in addition to their clinical experience and the patient's values during their clinical decision-making process. Where there is evidence that a form of care is inappropriate or unsafe, a practitioners' clinical experience should not be used to override the evidence.

Current best evidence is up to date information from relevant, valid research about the effects of different forms of healthcare. There is a wide range of evidence about chiropractic healthcare. The fact sheet provides further detail and a hierarchy of evidence scale.

Evidence-based practice

The role of the Chiropractic Board of Australia (the Board) is to protect the public consistent with the Health Practitioner Regulation National Law, as in force in each state and territory (the National Law). It does this through its work in the National Registration and Accreditation Scheme (the National Scheme) in partnership with the Australian Health Practitioner Regulation Agency (Ahpra).

The core role of the Board and Ahpra is to protect the public. All chiropractors have a duty to make safe and effective patient care their primary concern.

Overview

Best practice approaches to providing chiropractic care are published in peer reviewed literature. This evidence should be used to guide clinical practice and ensure chiropractors provide safe care. The Board expects chiropractors to make sure their clinical practice is consistent with current evidence and/or best practice approaches.

What is current best evidence?

Collapse

Current best evidence is up-to-date information from relevant, valid research about the effects of different forms of health care.

There is a wide range of evidence about chiropractic healthcare. This evidence includes randomised controlled trials, non-randomised controlled studies, descriptive studies, qualitative research and other evidence. Not all evidence is equally convincing. Some types of evidence are considered more reliable than others. There is a hierarchy of evidence that rates different types of evidence for reliability.

Table A - Hierarchy of evidence

Level I	Evidence is considered to be the best quality evidence. It includes the systematic review or meta-analysis of Level II studies. A systematic review aims to provide an exhaustive summary of current literature relevant to a particular research question.
Level II	Evidence takes the form of a randomised controlled trial (RCT). RCT's are often used to test the effectiveness of health interventions. The subjects in an RCT are randomly allocated to one or more blinded treatment groups and the results of these groups are usually compared to a control group of subjects who received no or placebo treatment.
Level III-1	Evidence includes pseudorandomised controlled studies that assign subjects to a treatment method based on location, days of the week or other non-randomised methods and compare the outcomes from each group.
Level III-2	Evidence includes studies that compare outcomes for subjects who have undergone a particular treatment with subjects who have not. The study may be designed as a prospective or retrospective study.
Level III-3	Evidence includes studies that compare the outcomes from two or more studies or analyse trends in outcome that are measured over multiple time points. A comparative study without concurrent controls.
Level IV	Evidence consists of case series with either post-test or pre-test outcomes and includes case studies of single or small numbers of subjects.

Evidence based on clinical experience and/or case studies is not considered valid or reliable as it is based on a small sample size and is not blinded or randomised making it subject to practitioner and patient bias.

It's important to note when the research was undertaken to ensure that evidence used for clinical decision making is current.

Does evidence-based practice mean that I can only use treatments with high level evidence?

Evidence-based practice means that chiropractors should make decisions about the care of the individual patient by integrating their individual clinical expertise with the best available clinical evidence. Relevant evidence is not always available to help with decision-making about every condition.

However, clinical experience on its own is rarely sufficient to justify a clinical decision. A chiropractor is entitled to use their clinical experience to help in their decisions regarding patient care. In cases where there is only low-level evidence to support a particular treatment choice, they should inform the patient of this fact and that it is their clinical experience that the treatment may be effective for the presenting condition. Without this information and understanding of the benefits and risks involved, the patient is unable to make an adequately informed decision about their health care.

More importantly where there is evidence that a form of care is inappropriate or unsafe, a practitioners' clinical experience or patient's preference should not be used to override the evidence.

What does it mean in practice?

The Board's Code of conduct states that good practice includes ensuring services provided are appropriate, necessary, and likely to benefit the patient. It requires practitioners to understand and apply public health principles and use the best available evidence in making clinical decisions. A chiropractors role is to be an advisor who empowers informed patient decisions. Relying only on those studies that support your views and/or practice style does not constitute evidence-based practice. Good practice includes encouraging and supporting patients to be well-informed about their health, and to use this information wisely when they are making decisions.

Chiropractors should recognise that their clinical experience cannot be used to justify treatment that is contradictory to other treatment modalities that have good evidence for their efficacy.

Ensuring informed consent

Informed consent is a patient's voluntary decision about healthcare that is made with knowledge and understanding of the benefits and risks involved. This is important to ensure patients have relevant information before making a decision about care. For children this includes the consent of a parent, carer, guardian or other substitute decision maker (parent/guardian) as appropriate. Informed consent needs to be specific to the patient's condition and the recommended treatment.

A chiropractor should consider the age, maturity and intellectual capacity of young people and other groups that may have additional needs and provide information in a way that they can understand. An older child with the ability to understand should be encouraged to participate in the discussion.

Practicing within the chiropractor's skills, competence and expertise

The Council on Chiropractic Education Australasia's Competency Standards for graduating chiropractors identify the measurable levels of knowledge, skills, attitudes, values and professional capabilities required to competently practise as a chiropractor in Australia. The competency standards describe the threshold level of competency expected for initial registration and continuing practice.

Continuing professional development (CPD) is an important way for practitioners to maintain and improve knowledge and skills and stay up to date in their area of practice. The National Law requires health practitioners complete CPD and the Board's Registration standard Continuing professional development (2019) sets out the expectations.

Practitioners should routinely apply self-reflection, practice improvement and performance-appraisal processes to critically evaluate their strengths and weaknesses to maintain their professional expertise.



Aboriginal and Torres Strait Islander Health Practice
Chinese Medicine
Chiropractic
Dental
Medical
Medical Radiation Practice
Nursing and Midwifery
Occupational Therapy
Optometry
Osteopathy
Pharmacy
Physiotherapy
Podiatry
Psychology

Australian Health Practitioner Regulation Agency

For advertisers including registered health practitioners

GUIDELINES FOR **ADVERTISING REGULATED HEALTH SERVICES**

May 2014

Guidelines for advertising a regulated health service

Section 4.1 of the Guidelines for advertising a regulated health service outlines how advertising may be false, misleading or deceptive including:

- when it compares health outcomes, regulated health professions or practitioners or prices without complete information.
- when it makes claims about providing a superior regulated health service

Evidence-based practice fact sheet

The Board's Evidence-based practice fact sheet advises that a practitioner's clinical experience ranks as a very low level of evidence because of the small sample size and the lack of control for factors including placebo effect. As a result, practitioners should recognise that their clinical experience cannot be used to justify treatment when there is good evidence for the efficacy of other treatment modalities that is contradictory.

Advertising practices in accordance with regulatory expectations

Advertising is an important way that chiropractors can promote their services to the public. As advertising can influence a patient's decision-making about their health care needs it is important for patients to have access to information that is accurate, supported by acceptable evidence and not misleading. Advertising should not encourage a patient to seek chiropractic care in the absence of a link to a specific condition or symptom and any claims need to be supported by acceptable evidence.

The National Law establishes the requirements for advertising a regulated health service. These requirements are important for public protection and help to ensure the public receives accurate and honest information about healthcare services.

There is an important difference between acceptable evidence for claims made in advertising and the evidence used for clinical decisions about patient care. When treating patients, chiropractors must obtain informed consent for the care provided and are expected to discuss the evidence for different treatment options. In advertising, the claims are generic, and practitioners are not available to clarify whether a treatment is appropriate for an individual patient.

The Check your advertising: Chiropractic examples explain that there is insufficient acceptable evidence to support claims in advertising that there is a relationship between manual therapy (e.g. spinal adjustments and/or manipulation) for spinal problems and achieving general wellness or treating various organic diseases and infections; or that spinal problems may have a direct role in the genesis of various organic diseases and infections.

The following types of studies will generally not be considered acceptable evidence for advertising claims:

- studies involving no human subjects
- before and after studies with few or no controls
- self-assessment studies
- anecdotal evidence based on observations in practice
- outcome studies or audits, unless bias or other factors that may influence the results are carefully controlled, and/or
- studies that are not applicable to the target population.

Factors for assessing if evidence is acceptable

Resources

Checklist for practitioners handling feedback and complaints

Code of conduct

Advertising hub

Advertising guidelines and other guidance

Advertising and the law

Advertising guidelines

Summary of the advertising requirements

Acceptable evidence in health advertising

National Board statements related to advertising

Resources for advertisers

Information for the public

Advertising complaints

Frequently asked questions

Social media: How to meet your obligations under the National Law

Cosmetic surgery hub

To avoid misleading the public, claims made in advertising about regulated health services must be supported by acceptable evidence. The Australian Health Practitioner Regulation Agency (Ahpra) and National Boards' approach to assessing evidence to support claims is consistent with the wider scientific and academic community.

In general, evidence is assessed as 'acceptable' where a body of evidence rates highly against the six factors highlighted below. These factors should be considered when assessing advertising claims about the benefits or effectiveness of a health service.

Expand all | Collapse all

- Source of the evidence – Is your evidence from a publicly accessible and reliable source? Expand
- Relevance of the evidence – Can the evidence be applied to your advertising claim? Expand
- Inclusion of the evidence – Have you considered the relevant evidence equally? Expand
- Level of the evidence – Was the study design a high enough level to support your advertising claim? Expand
- Quality of the evidence – Did your evidence use appropriate research methods? Expand
- Strength of the evidence – Does your evidence show a meaningful effect that supports your advertising claim? Expand

Inclusion of the evidence – Have you considered the relevant evidence equally?

Collapse

Have the relevant sources of evidence been identified and considered equally? Is it possible that any important evidence was missed?

If you only select evidence that supports your advertising claim, your claim is at risk of reporting bias. This is not acceptable evidence selection.

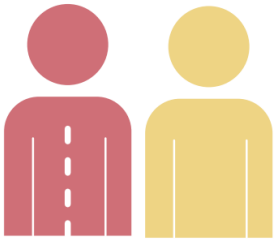
Did more than one study show the same thing?

- Is your evidence from independent studies? You cannot use evidence from the same study twice. For example, the individual papers used within a systematic review cannot be included separately as additional evidence for your advertising claim.
- Does all the evidence come from one research group? The most reliable evidence comes from several different and independent research groups with the same conclusions.
- Have the results been tested over a wide range of conditions/scenarios? This is to ensure the results are reliable and robust.
- Can any variations in the results between studies be explained?

Note: If many well-conducted and independent studies support your claim, you can be more confident in the evidence. However, if there are some studies that contradict your claim, you need to acknowledge and carefully consider these before you can make your claim.

Examples of non-compliant advertising and how to correct it

A1. This advertising is not supported by acceptable evidence



Example chiropractors inc.

Chiropractic has been proven to be a very safe and effective healthcare modality in Australia

Chiropractic treatment can help with:

- **back pain**
- **neck pain**
- **joint and muscle stiffness**
- **asthma**
- **indigestion**
- **ear infections**
- **behaviour disorders**
- **boosting immune functions**

Contact us to book an appointment!

This statement could be corrected to read:

Chiropractic treatment may help patients to manage a range of musculoskeletal conditions, as well as musculoskeletal aspects of non-musculoskeletal conditions

See Note 1 for more information

This statement could be corrected to read:

Chiropractic treatment can help with:

- **Back pain**
- **Neck pain**
- **Joint and muscle stiffness**
- **Managing symptoms such as muscular tension often associated with asthma**

See Note 2 for more information

This advertising is considered false misleading and deceptive. Parts of this advertising are unqualified and/or are not supported by acceptable evidence and therefore may mislead consumers.

Notes

1. It is potentially misleading to state or imply that chiropractic treatment or a particular approach is safe without also acknowledging that individuals respond differently and all forms of treatment have the potential for adverse events. Advertising about chiropractic treatment should not imply that a treatment or service cannot cause harm or have no adverse effects.

   Generalisations about chiropractic being effective are also often misleading and risk implying an unreasonable expectation of benefit.

2. The limited research evidence across manual therapies is not supportive of practitioners making advertising claims that they can effectively treat non-musculoskeletal conditions. However, sometimes chiropractic care may benefit aspects of some non-musculoskeletal conditions and syndromes.

   Where chiropractic can assist with musculoskeletal aspects of a non-musculoskeletal condition (such as assisting with the muscular tension associated with asthma), this needs to be made clear (qualified) in your advertising, otherwise your advertising may be misleading. Ear infections, indigestion, behaviour disorders, immune functions are non-musculoskeletal conditions and have no clear musculoskeletal symptoms. They do not justify a reference to these conditions in advertising by a chiropractor.

   The use of a list of health conditions in advertising is often misleading because a list does not include enough information on how chiropractic treatment can assist the listed conditions.

   If there is no or insufficient acceptable evidence to support treatment claims, such as non-musculoskeletal conditions, they must not be included in advertising.

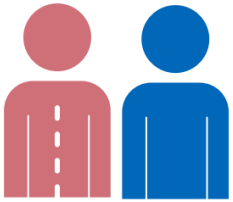
   The Board is particularly concerned about treatment claims that suggest there is a relationship between manual therapy (e.g. manipulation) for spinal problems and treating various organic diseases and infections, such as ear infections.

Notes

1. The Board is concerned about claims in advertising that there is a relationship between manual therapy (e.g. spinal adjustments and/or manipulation) for spinal problems and achieving general wellness or treating various organic diseases and infections; or that spinal problems may have a direct role in various organic diseases and infections. There is insufficient acceptable evidence to support these claims.

   Of particular concern is the number of treatment claims in advertising relating to infants and children. Claims suggesting that manual therapy for spinal problems can assist with general wellness and development, and/or benefit a variety of paediatric syndromes and organic conditions are not supported by acceptable evidence.

A3. This advertising is not supported by acceptable evidence



Example chiropractors inc.

Are you pregnant?

Chiropractic treatment can help pregnant women with:

- **back pain and spinal pain**
- **other pregnancy related musculoskeletal pains**
- **reducing pain medication**
- **stabilising hormone levels**
- **morning sickness and nausea**
- **shorter labour times**
- **a more comfortable delivery**
- **increased chance of a natural birth**
- **optimal foetal positioning/malpositioned foetus/ breech baby**
- **improving your overall health and wellbeing giving the baby a healthier environment to grow.**

Chiropractic treatment can help clear your nervous system of interferences, which in turn can improve fertility, and aid in conception to become pregnant.

Contact us to book an appointment!

This statement could be corrected to read:

Chiropractic treatment can help pregnant women with:

- **back and spinal pain**
- **other pregnancy related musculoskeletal pains**
- **reducing the need for pain medication for musculoskeletal conditions**

See Note 1 for more information

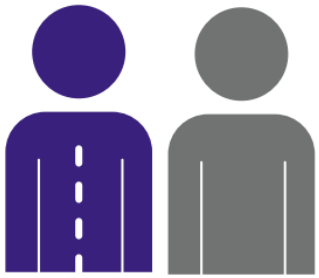
This statement cannot be corrected and must be removed

See Note 2 for more information

This advertising is considered false, misleading or deceptive. Parts of this advertising are not supported by acceptable evidence so may not be included in advertising.

If there is not acceptable evidence to support a claim it may not be in included in advertising

D. Advertising that includes testimonial



Example chiropractors inc.

Jac, 47, is one of our many patients who experienced great results with chiropractic treatment. Jac says: 'As a patient who has received this treatment, I confirm that it really does work and my chronic back pain is much improved after only five sessions'.

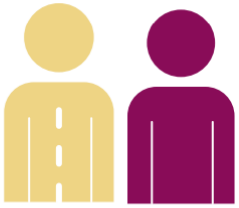
Contact us to book an appointment!

An example of a recommendation that could be used in advertising:

Alex, 35, says: 'The practice is in a great spot so parking isn't a problem. The staff are lovely and I have been going there for many years'.

See Note 1 for more information

E. This advertising encourages the unnecessary use of regulated health services



Example chiropractors inc.

Did you know that regular checking of newborns, toddler and children's spines by a chiropractor for subluxations are essential to help deal with trauma in gestation/birth/childhood and prevent illness later in life? Book a visit for your child now.

The birth process can, and often does, cause your baby's first subluxation, especially if forceps or suction is used. During birth the shape of the baby's head can be altered and it can also place unnecessary pressure on parts of the brain which if not corrected can lead to subtle changes in development.

The sooner a baby can be checked following birth the sooner the bone structure of the baby can be accessed and corrected if needed.

Having your child's spine carefully assessed for spinal problems after birth gives them a good foundation for healthy growth and development later in life. Many parents are amazed at how such gentle and non-invasive care can make such a positive impact on the health of their child.

Contact us to book an appointment!

These statements cannot be corrected and must be removed

See Note 1 for more information

These statements cannot be corrected and must be removed

See Note 2 for more information

This advertising is considered to encourage the unnecessary use of regulated health services. The advertising is also considered to be false, misleading and deceptive as it includes claims that are not supported by acceptable evidence.

AHPRA

Aboriginal and Torres Strait Islander Health Practice
Chinese Medicine
Chiropractic
Dental
Medical
Medical Radiation Practice
Nursing and Midwifery
Occupational Therapy
Optometry
Osteopathy
Pharmacy
Physiotherapy
Podiatry
Psychology

Australian Health Practitioner Regulation Agency

For advertisers including registered health practitioners

GUIDELINES FOR **ADVERTISING REGULATED HEALTH SERVICES**

May 2014

Bronfort et al. Chiropractic & Osteopathy 2010, 18:3
http://www.chiroandosteo.com/content/18/1/3

CHIROPRACTIC & OSTEOPATHY

REVIEW Open Access

Effectiveness of manual therapies: the UK evidence report

Gert Bronfort[1*], Mitch Haas[2], Roni Evans[1], Brent Leininger[1], Jay Triano[3,4]

Abstract

Background: The purpose of this report is to provide a succinct but comprehensive summary of the scientific evidence regarding the effectiveness of manual treatment for the management of a variety of musculoskeletal and non-musculoskeletal conditions.

Methods: The conclusions are based on the results of systematic reviews of randomized clinical trials (RCTs), widely accepted and primarily UK and United States evidence-based clinical guidelines, plus the results of all RCTs not yet included in the first three categories. The strength/quality of the evidence regarding effectiveness was based on an adapted version of the grading system developed by the US Preventive Services Task Force and a study risk of bias assessment tool for the recent RCTs.

Results: By September 2009, 26 categories of conditions were located containing RCT evidence for the use of manual therapy: 13 musculoskeletal conditions, four types of chronic headache and nine non-musculoskeletal conditions. We identified 49 recent relevant systematic reviews and 16 evidence-based clinical guidelines plus an additional 46 RCTs not yet included in systematic reviews and guidelines.
Additionally, brief references are made to other effective non-pharmacological, non-invasive physical treatments.

Conclusions: Spinal manipulation/mobilization is effective in adults for: acute, subacute, and chronic low back pain; migraine and cervicogenic headache; cervicogenic dizziness; manipulation/mobilization is effective for several extremity joint conditions; and thoracic manipulation/mobilization is effective for acute/subacute neck pain. The evidence is inconclusive for cervical manipulation/mobilization alone for neck pain of any duration, and for manipulation/mobilization for mid back pain, sciatica, tension-type headache, coccydynia, temporomandibular joint

I manipulate spines to help with pain

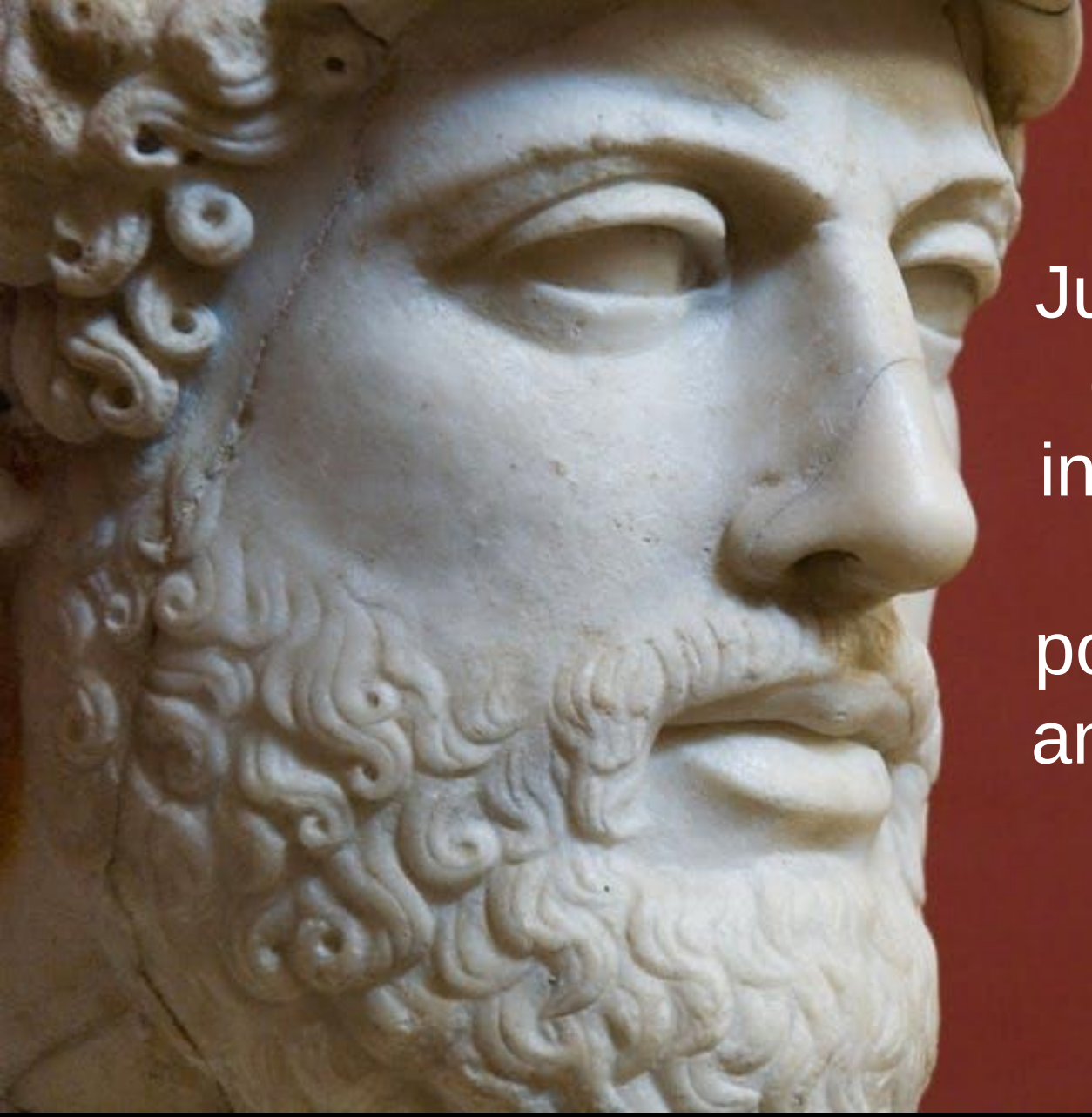
Pain sensation has neural pathways that travel from joints to the brain

These pathways have secondary and tertiary connections to the immune system, mood, and bodily function

Subluxations don't exist and there's no connection between the spine and nervous system



imgflip.com



Just because you do not take an interest in politics doesn't mean politics won't take an interest in you.

~

Pericles

APPENDIX “N”



Evidence Informed Practice

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College of Chiropractors of British Columbia

Policy Title – Efficacy Claims **Responsible Office: College of Chiropractors of British Columbia ("CCBC")** **Contact:** registrar@chirobc.com	**Reference Information:** *TBD*
	Replaces former policy: NA
	Date Effective: October 1, 2018
	Last Update: NA
	Next Review Date: September 30, 2019
Keywords	**E.g. efficacy, marketing, advertising, acceptable evidence**

1. **Policy Rationale & Purpose:**

   As stated in section 14(1)(f) and Appendix "N" of the CCBC's *Professional Conduct Handbook* ("PCH"), chiropractors must not advertise health benefits of their services when there is no acceptable evidence that those benefits can be achieved. The Board is concerned registrants may be making claims in marketing or directly to patients that chiropractic care has beneficial effects on some diseases, disorders and conditions when there is no acceptable evidence for those claims.

   This policy identifies efficacy claims that are not supported by acceptable evidence, and therefore, must not be made.

2. **Policy Scope**

   This policy applies to all registrants who market or advertise their services.

3. **Policy Statement:**

   Due to the absence of acceptable evidence supporting such claims, **registrants must NOT represent** to patients or the public that chiropractic:

   (a) can be used to treat diseases, disorders or conditions such as: Alzheimer's disease, cancer, diabetes, infections, infertility, or Tourette's syndrome, or

   (b) has any beneficial effect on childhood diseases, disorders or conditions such as: ADHD (or ADD), autism spectrum disorders including Asperger syndrome, cerebral palsy, Down syndrome, fetal alcohol syndrome, or developmental and speech disorders.

   The above list of diseases, disorders or conditions is neither final nor conclusive. Absent acceptable evidence, registrants are not free to make claims about the effectiveness of chiropractic in treating a disorder, disease or condition simply because it is not included in the list.

British Columbia

Efficacy Claims Policy

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"has ***any beneficial effect*** on childhood diseases, disorders or conditions such as: ADHD (or ADD), autism spectrum disorders including Asperger syndrome, cerebral palsy, Down syndrome, fetal alcohol syndrome, or developmental and speech disorders."

Acceptable Evidence?

6. **Definitions:**

- "acceptable evidence" means objective, clear evidence based on accepted principles of good research that support the therapeutic claim (see Appendix "N" of PCH)

APPENDIX "N": Acceptable Evidence

It is the duty of a registrant, when requested by the college or Inquiry Committee to verify statements and claims made in their marketing materials

The College of Chiropractors of British Columbia (CCBC) recognizes that chiropractic care may offer relief for persons experiencing neuro-musculoskeletal symptoms. Chiropractors must not make statements or claims that create an unjustified expectation of the potential benefit of chiropractic treatment and care.

Under section 85 of the College Bylaws, registrants must not engage in marketing that is false, inaccurate, unverifiable, misleading or misrepresentative of the effectiveness or a technique, procedure, instrument or device. Both specific claims and the overall impression of marketing must be considered. Marketing violates section 85 if it is likely to create unjustified expectations for treatment in the mind of patients or the public.

In addition to more traditional advertisements and printed materials, marketing also includes the use of websites, email newsletters, social media, promotional activities and public appearances. Chiropractors are strongly encouraged to regularly review their marketing to ensure compliance with section 85 of the Bylaws and Part 14 of the College's Professional Conduct Handbook.

What is acceptable evidence?

Adopted from the Australian Health Practitioner Regulation Agency

Chiropractors must not advertise health benefits of their services when there is not acceptable evidence that these benefits can be achieved.

When assessing whether there is acceptable evidence for therapeutic claims, the issues to consider include:

- Is the evidence relied on objective and based on accepted principles of good research? Is the evidence from a reputable source? For example a properly peer-reviewed journal.
- Do the studies used provide clear evidence for the therapeutic claims made or are they one of a number of possible explanations for treatment outcomes?
- Have the results of the study been replicated? Results consistent across multiple studies, replicated on independent populations, are more likely to be sound.
- Has the evidence been contradicted by more objective, higher quality studies? (For example, evidence from a single study would not be acceptable evidence if it is contradicted by a systematic review) Statements and claims in marketing that are contrary to higher-level evidence are not acceptable.

The following types of studies may not be considered sufficient acceptable evidence for advertising claims:

Back to Top

British Columbia

"Acceptable" Evidence

What is acceptable evidence?

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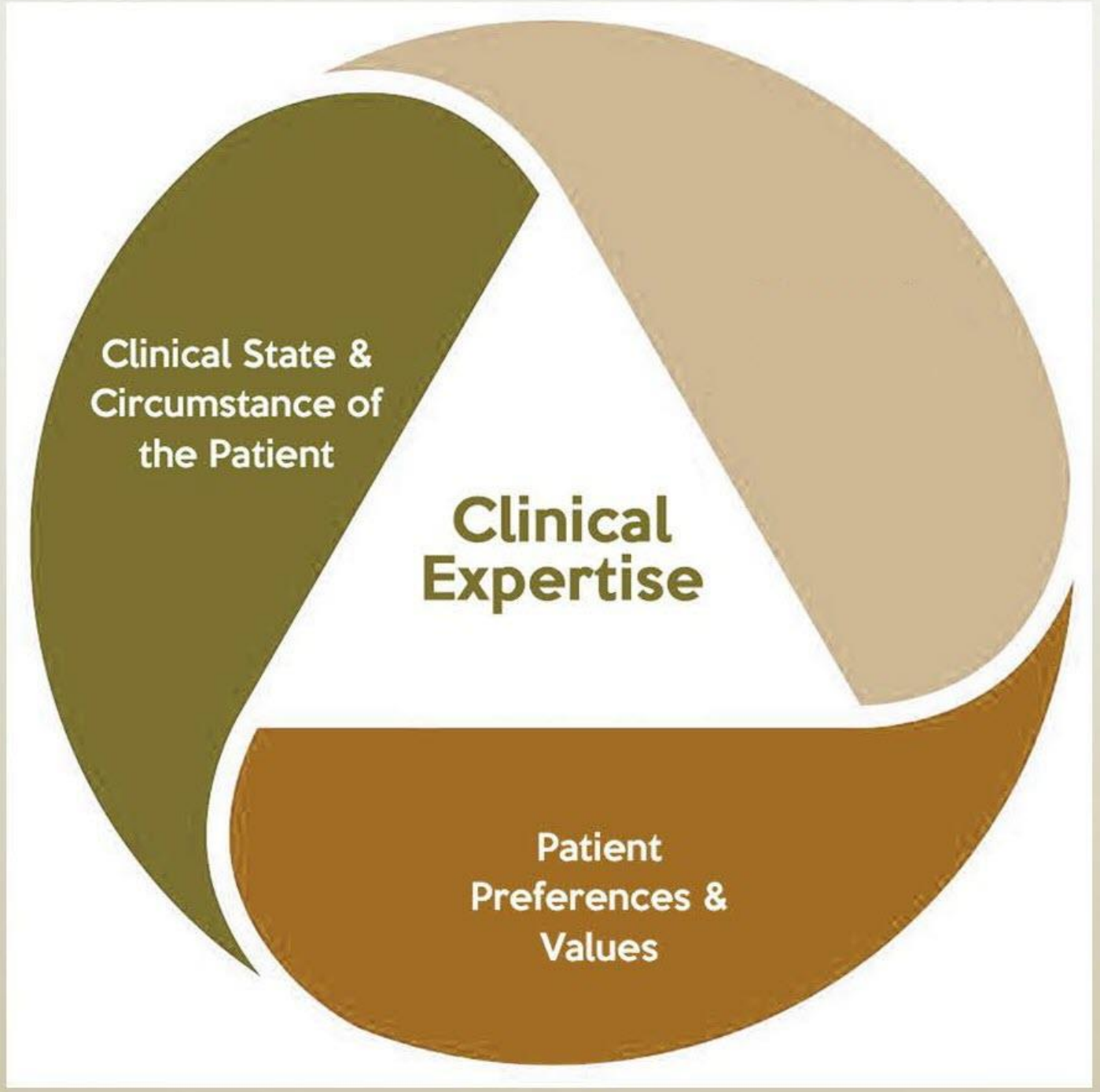
- Studies involving no human subjects;
- before and after studies with little or no control or reference group (eg. case studies);
- self-assessment studies;
- anecdotal evidence based on observations in practice; and,
- outcome studies or audits, unless bias or other factors that may influence the results are carefully controlled.

The evidence base for clinical practice is constantly developing so it is important that chiropractors make sure that any scientific information they rely on is current.
Chiropractors must take care to not mislead or create false impressions when using scientific information in marketing. Scientific information in marketing must be presented in a manner that is accurate, balanced and not misleading and using wording that will be readily understood by the intended recipients. The source of the information must be accurately cited.



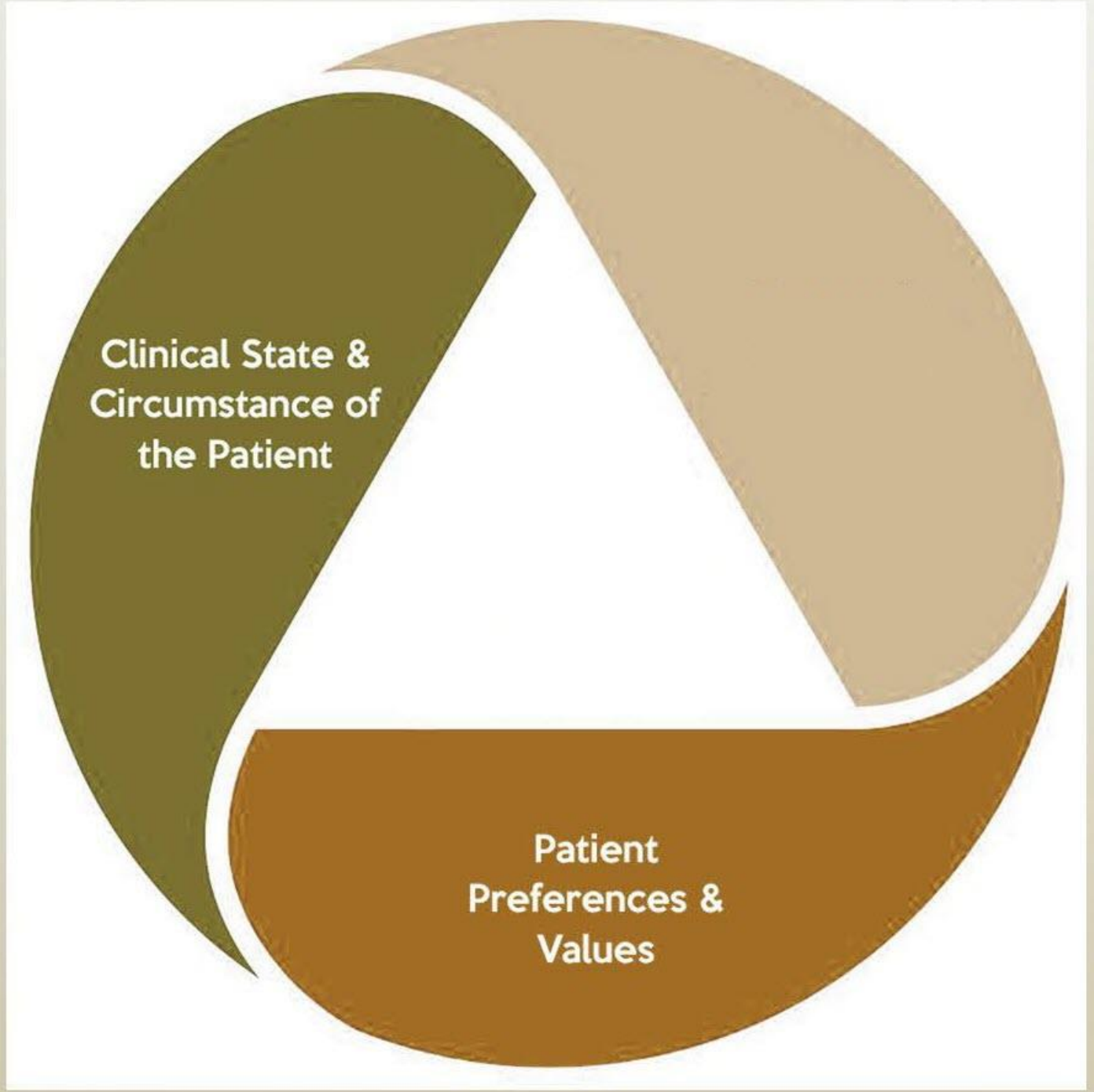
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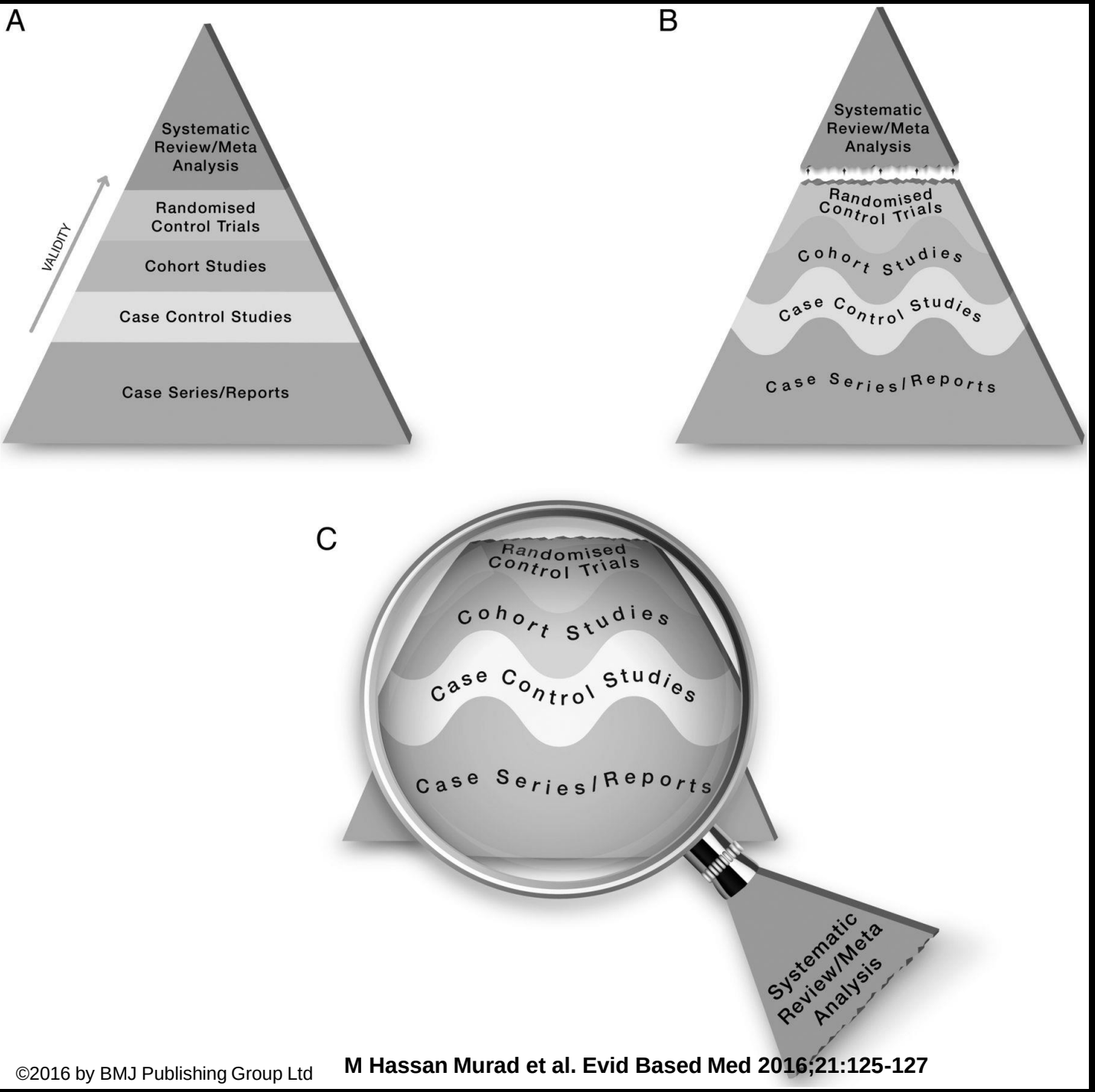


Evidence Informed Practice

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Hierarchy of Research Designs & Levels of Scientific Evidence





The proposed new evidence-based medicine pyramid.

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M Hassan Murad et al. Evid Based Med 2016;21:125-127

BMJ Evidence-Based Medicine

$12.00
U.S.

THE CONTROLLED CLINICAL TRIAL



An Analysis

Harris L. Coulter, Ph.D.

Center for Empirical Medicine
❖
Project Cure
Washington, D.C.
1991

What About the Patient?

"Patient preferences are critically important to clinical decision making and patient care. Few clinicians practicing modern day medicine would argue otherwise."

Umscheid CA. Should guidelines incorporate evidence on patient preferences? J Gen Intern Med, August 2009;24(8):988–990.

RCT’s

Can we identify the individual patient for whom one or the other of the treatments is the right answer? Clearly this is what we want to do...There are very few signs that they (investigators) are doing so.

Hill AB: "Reflections on the controlled clinical trial." Annals of the Rheumatic Diseases 25:107, 1966.

RCT's—Gold Standard or Fool's Gold

To sum up, whoever is seeking documentation of clinical practice needs to be critical enough to avoid the lure of the gold standard in assessing evidence, so as not to end up like the three prospectors in "The Treasure of Sierre Madre" who, much to their great horror, find that they have come up with fool's gold.

Rosner A: Reality-Based Evidence: Prospecting for the Elusive Gold Standard. *Dynamic Chiropractic February 25, 2002.*

RCT's

"The clinical trial is an experiment performed on an unreal, unknown, mysterious entity — an assembly of sick people who have some features in common. Its results cannot be extrapolated to any larger population, and the information cannot be reliably duplicated. What is worse, the results of the trial cannot even be extrapolated to the individual patient, who (not some faceless member of a 'homogeneous group') is still the object of medical ministration."

Coulter HL: The Controlled Clinical Trial: An Analysis. Center for Empirical Medicine. Washington, DC, 1991.

RCT's

"We consider the controlled clinical trial to be a wrongheaded attempt by man to subjugate nature. Its advocates hope to overcome the innate and ineluctable heterogeneity of the human species in both sickness and health merely by applying a rigid procedure."

Coulter HL: The Controlled Clinical Trial: An Analysis. Center for Empirical Medicine. Washington, DC, 1991.

Editorial

January 28, 1998

The Randomized Controlled Trial Gets a Middle-aged Checkup

Alejandro R. Jadad, MD, DPhil; Drummond Rennie, MD

» Author Affiliations

JAMA. 1998;279(4):319-320. doi:10.1001/jama.279.4.319

Although the first controlled trial in health care is thought to have occurred at least 3 centuries ago, the modern era of randomized controlled trials (RCTs) began in the late 1940s with the pioneering work of Bradford Hill.[1] During this 50-year period, RCTs have made important contributions in health care and have been used extensively. Hundreds of thousands of RCTs have been published, and the doubling time in some research areas is less than 10 years.[2] The main appeal of the RCT as a research tool in health care derives from its potential for reducing selection bias, particularly during the evaluation of diagnostic or therapeutic interventions. Researchers expect that randomization, if done properly, can keep study groups as similar as possible at the outset, thus enabling the investigators to iso-

RCT's

RCTs can be vulnerable to multiple types of bias at all stages of their life spans. . ."

and

"It has also been shown that most reports of RCTs, even those published in prominent journals, are incomplete and do not reflect the empirical methodological evidence available.

Jadad AR, Rennie D: "The randomized controlled trial gets a meddle-aged checkup." JAMA 1998;279(4):319.

David Eddy, M.D., Ph.D.

Where is the wisdom?

Only about 15% of medical interventions are supported by scientific evidence…This is partly because only 1% of the articles in medical journals are scientifically sound.

BMJ 1991 303:798

SORT

Strength of Recommendations Taxonomy

- A--consistent and good quality patient-oriented evidence
- B--inconsistent or limited quality patient-oriented evidence
- C--consensus, usual practice, opinion, disease-oriented evidence or case series

Table 4 Quality of Evidence Scale[7] (modified)

Class 1: Evidence provided by one or more well designed controlled clinical trials; or well designed experimental studies that address reliability, validity, positive predictive value, discriminability, sensitivity and specificity.
Class 2: Evidence provided by one or more well designed **controlled,** observational clinical studies, such as case-control, cohort studies, etc; or clinically relevant basic science studies that address reliability, validity, positive predictive value, discriminability, sensitivity, and specificity; and published in refereed journals.
Class 3: Evidence provided by expert opinion, descriptive studies or case reports, **surveys, literature reviews.**

Epistemology

- What evidence will you accept?
- What is the strength of the evidence?
- Science v. scientism

Hill's Criteria

- **Experimental Data**: From laboratory or human experimentation
- **Association**: Odds Ratios
- **Consistency:** repeated observation of an association in different populations, in different countries, and under different circumstances.
- **Temporality:** Causative factor precedes the outcome
- **Biologic Gradient**: The presence of a unidirectional relationship (dose-response) between the exposure and outcome of interest.
- **Coherence of Evidence**: A cause-effect relationship does not conflict with what is known of the natural history of the harmful outcome.
- **Biologic Plausibility**: Plausible based on general biologic knowledge
- **Specificity**: Requires that a single cause lead to a single effect.
- **Analogy**: Very weak criterion

How Good Is the Evidence to Support Primary Care Practice?

- In conclusion, approximately half of the recommendations for primary care practice are based on patient-oriented evidence, but only 18% are based on patient-oriented evidence from consistent, high-quality studies.

Edell MH, et al: Evid Based Med. 2017;22(3):88-92.

“If we are serious about coming to know something, then our research methods will have to be adapted to the nature of the phenomenon that we are trying to understand…One may need to draw on the totality of one’s experience, and not just on that subset that consists of observations made through the process of traditional scientific discovery”

Baruss I: Authentic Knowing.

Purdue University Press, 1996.



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Credible Evidence?



The chiropractic research abyss . . .



Health Policy



Neurodevelopmental Disorders and Chiropractic: A Systematic Review of the Literature

Jeffrey Holuszko BS, DC[1], Phillip Falardeau BS, DC[2], Cameron Banks, BS, DC[3], Hailey Coonrad BS, DC[4], Jerome Lubbe BA, DC[5], Kenichi Oumi BA, DC[6], Joseph Ritola BA, DC[7], Jill Smith BS, DC[8], Nicole Tukdarian BA, DC[9]

Abstract

Objective: To provide a comprehensive analysis of the current body of scientific literature regarding the chiropractic management of a wide variety of neurodevelopmental disorders.

Methods: A literature search was performed using PubMed, MANTIS, the Index to Chiropractic Literature, McCoy Press, Galileo, and ScienceDirect. Inclusion criteria consisted of full-text peer-reviewed articles written in English as they related to the efficacy of chiropractic management of neurodevelopmental disorders.

Results: 51 articles were selected. The results were: Three Randomized Controlled Trials (RCT), 7 Reviews of Literature, three Case Series, 34 Case Studies and three Survey/Commentaries.

Conclusion: There is a definite need for RCTs and subsequent systematic reviews of RCTs. Of research obtained in this study, the majority of articles dealt specifically with Autism Spectrum Disorder (ASD) and attention deficit disorder (ADD)/Attention Deficit Hyperactivity Disorder (ADHD) and were predominantly case studies. The chiropractic community should see this as a call to action to provide more substantive research regarding neurodevelopmental disorders.

Key Terms: *Chiropractic, subluxation, pervasive developmental disorders (PDD), ADD, ADHD, learning disorders, sensory processing disorders, developmental delays, developmental, Epilepsy, Autism Spectrum Disorders, ASD, Bipolar*

Introduction

Definition

Neurodevelopmental disorders are disabilities associated primarily with the functioning of the neurological system and brain. According to *Pediatric Chiropractic*[1] these include but are not limited to Attention Deficit Disorder (ADD), Attention Deficit Hyperactivity Disorder (ADHD), learning disorders, sensory processing disorders, developmental delays, Cerebral Palsy (CP), mental retardation, epilepsy & seizure, Autism Spectrum Disorders (ASD) and Bipolar Disorder (BD). Possible etiologies for neurodevelopmental disorders involve environmental, biological and/or genetic factors.

It is important to note the etiology of neurodevelopmental disorders is not the focus of this review. Rather, we focus on the systematic review of literature and efficacy of chiropractic care for the treatment of neurodevelopmental disorders after manifestation and or proper medical diagnosis in children and young adults.

1. Private Practice of Chiropractic, Newport, NH
2. Private Practice of Chiropractic, Nashua, NH
3. Private Practice of Chiropractic, Atlanta, GA
4. Private Practice of Chiropractic, Paramus, NJ
5. Staff Clinician, Carrick Brain Centers, Irving, TX
6. Private Practice of Chiropractic, Arlington, VA
7. Private Practice of Chiropractic, San Cruz, CA
8. Private Practice of Chiropractic, Sarasota, FL
9. Private Practice of Chiropractic, Smyrna, GA

As of 2015

Summary

Total Number of Studies	39
Total Number of Subjects	66
Case Studies	26
Case Series	4
Reviews	3
Systematic Reviews	2
Commentaries	2
Cohort	1
RCT	1

More on that shortly but first a brief review . . .

War Horses



"A great profession can only be sustained through the authentic transmission of its principles from generation to generation."

"A subluxation means pressure on nerves, abnormal functions creating a lesion in some portion of the body, either in its action or its makeup."

DD and BJ Palmer: The Science of Chiropractic



Models of Vertebral Subluxation

Component Models

Subluxation Degeneration Model

Nerve Root Compression Model

Dysafferentation Model

Neurodystrophic Model



VERTEBRAL SUBLUXATION COMPLEX

Kinesiopathology

Connective Tissue Pathology

Myopathology

Neuropathology

Vascular Pathology

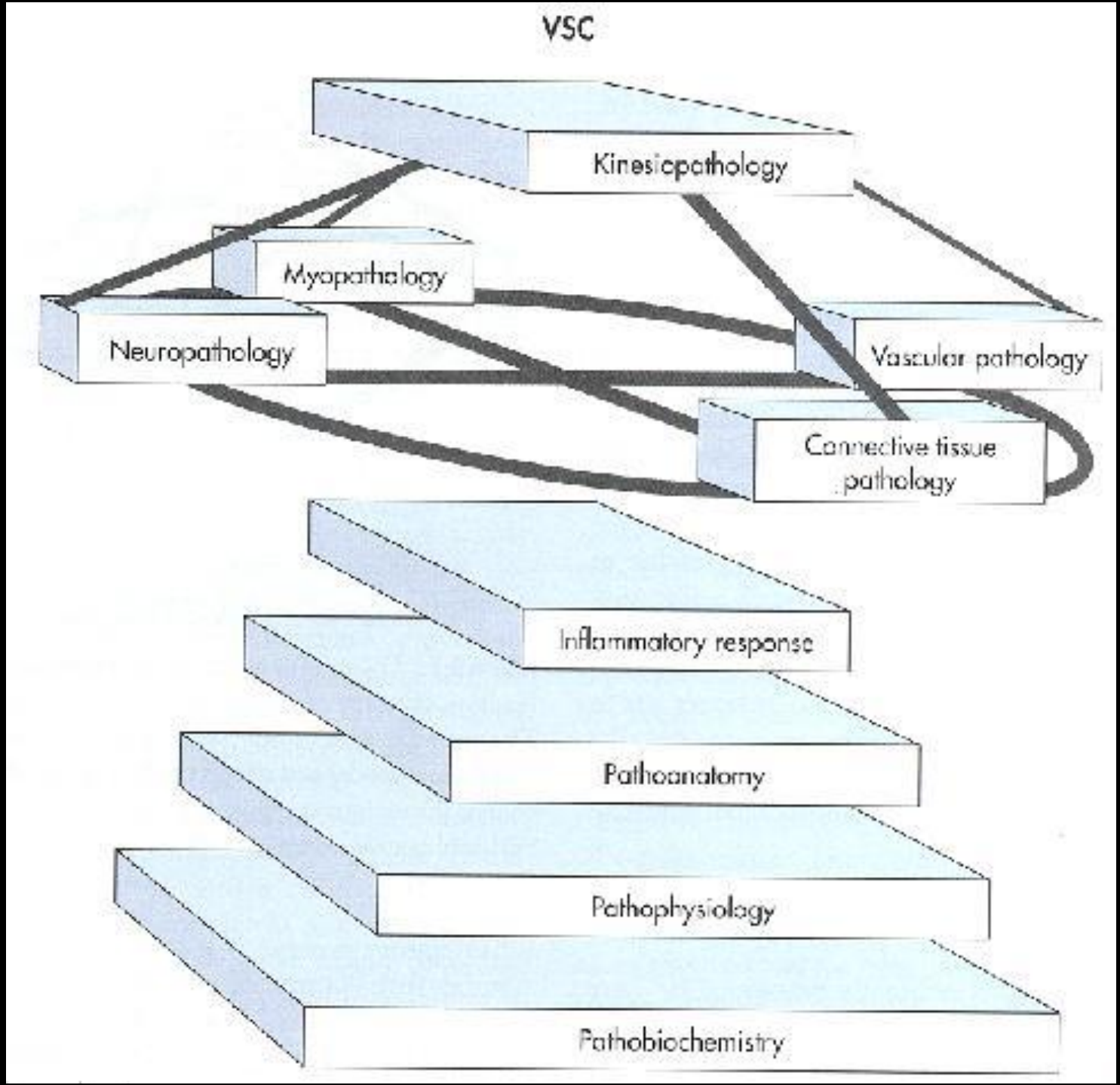
Inflammatory Response

Pathoanatomy

Pathophysiology

Pathobiochemistry




VSC
Kinesiopathology
Myopathology
Neuropathology
Vascular pathology
Connective tissue pathology
Inflammatory response
Pathoanatomy
Pathophysiology
Pathobiochemistry

CHIROPRACTIC SUBLUXATION

-Vertebral Subluxation Complex

- **-Kinesiopathology**
- **-Connective Tissue Pathology**
- **-Myopathology**
- **-Neuropathology**
- **-Pathoanatomy**
- **-Pathophysiology**
- **-Pathobiochemistry**
- **-Vascular Pathology**

-Nerve Compression Hypothesis
-Proprioceptive Insult
-Somatosympathetic Reflex
-Viscerosomatic Reflex
-Somato-Somato Reflex
-Neurodystrophic
-Dentate Ligament Cord Distortion
-Psychogenic
-Cord Compression
-Brain Hibernation
-Neuroplasticity/Spinal Learning
-Dysafferentation



Stuck Joint Model

Goal is to unstick stuck joints

Accomplished via:

- Grip & Rip
- Bump Thumping
- Million Dollar Rolls

Dysponesis

Dysponesis is evidenced by abnormal tonic muscle activity. Dysponesis refers to a reversible physiopathologic state consisting of errors in energy expenditure, which are capable of producing functional disorders. Dysponesis consists mainly of covert errors in action potential output from the motor and premotor areas of the cortex and the consequences of that output. These neurophysiological reactions may result from responses to environmental events, bodily sensations, and emotions.

The resulting aberrant muscle activity may be evaluated using surface electrode techniques. Typically, static SMEG with axial loading is used to evaluate innate responses to gravitational stress.



Dysautonomia

The autonomic nervous system regulates the actions of organs, glands, and blood vessels. Acquired dysautonomia may be associated with a broad array of functional abnormalities.

Sympathetic tone may be evaluated by measuring skin temperature differentials using paraspinal infrared thermography

Such techniques have been used to monitor changes in neurological function associated with vertebral subluxations Heart rate variability is a reliable and valid technique for the assessment of changes in autonomic nervous system function.



Non-Synaptic Messaging

AXOPLASMIC TRANSPORT

EPHAPSIS

VOLUME TRANSMISSION

NEUROPEPTIDES

FIELD EFFECTS



A Proposed Vertebral Subluxation Model Reflecting Traditional Concepts and Recent Advances in Health and Science. William R. Boone, Ph.D, D.C. and Graham J. Dobson, D.C. Journal of Vertebral Subluxation Research. Volume 1. Number 1. Pages 1-12

AXOPLASMIC TRANSPORT

Substances "flow" bi-directionally.

Includes Proteins, Neurotransmitters & Growth Factors.

Propulsion is via actomyosin (contractile protein).

Constructive functions

A Proposed Vertebral Subluxation Model Reflecting Traditional Concepts and Recent Advances in Health and Science. William R. Boone, Ph.D, D.C. and Graham J. Dobson, D.C. Journal of Vertebral Subluxation Research. Volume 1. Number 1. Pages 1-12



EPHAPSIS

Where two or more axons and/or dendrites touch without forming a typical synaptic contact.

Information flow to tissues can occur even with total lack of the action potential.

It still uses the nerve for conveyance.

A Proposed Vertebral Subluxation Model Reflecting Traditional Concepts and Recent Advances in Health and Science. William R. Boone, Ph.D, D.C. and Graham J. Dobson, D.C. Journal of Vertebral Subluxation Research. Volume 1. Number 1. Pages 1-12



VOLUME TRANSMISSION

Involves the flow of ionic currents and chemical signals transmitted or radiated from neurons.

Neuroendocrine release appears to involve only volume transmission.

There are over 50 informational substances modulating brain function. The signal specificity resides in distinct classes of recognition molecules (receptors) rather than through the synapse.



A Proposed Vertebral Subluxation Model Reflecting Traditional Concepts and Recent Advances in Health and Science. William R. Boone, Ph.D, D.C. and Graham J. Dobson, D.C. Journal of Vertebral Subluxation Research. Volume 1. Number 1. Pages 1-12

NEUROPEPTIDES

Neuropeptides and their receptors join the brain, glands and immune system in a network of communication between the brain and body

A Proposed Vertebral Subluxation Model Reflecting Traditional Concepts and Recent Advances in Health and Science. William R. Boone, Ph.D, D.C. and Graham J. Dobson, D.C. Journal of Vertebral Subluxation Research. Volume 1. Number 1. Pages 1-12



FIELD EFFECTS

Mediated by large extracellular currents or generated by axons during growth and repair

A Proposed Vertebral Subluxation Model Reflecting Traditional Concepts and Recent Advances in Health and Science. William R. Boone, Ph.D, D.C. and Graham J. Dobson, D.C. Journal of Vertebral Subluxation Research. Volume 1. Number 1. Pages 1-12



Other Models

DENTATE LIGAMENT

CORD DISTORTION

•

PSYCHOGENIC

•

BRAIN HIBERNATION



Psychosocial Models

- Psychogenic concepts: mental/emotional state influence on structure
- Somatopsychic concepts: structural influence on mental/emotional states



Stress Response

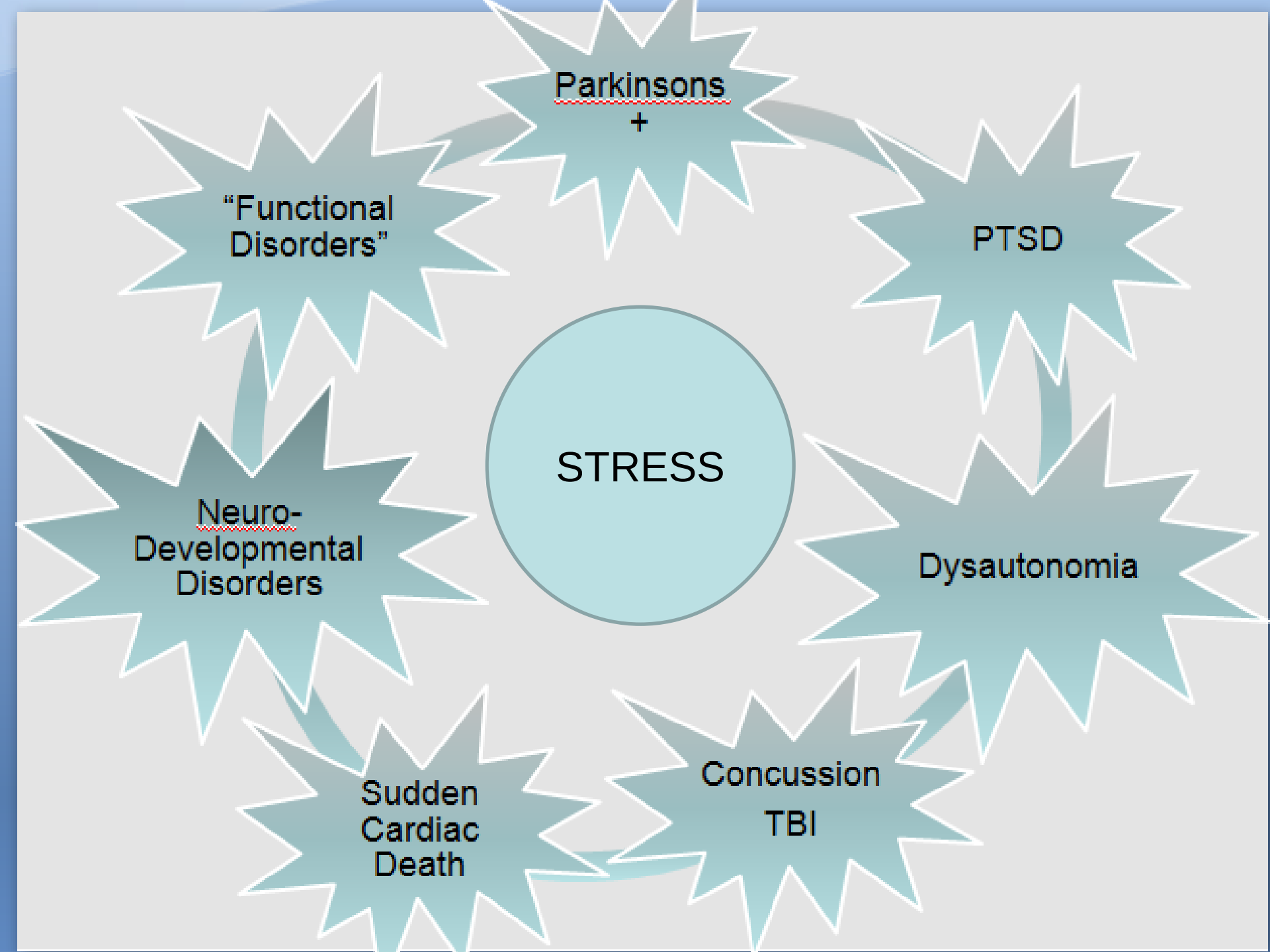
- **Increases**
  - Cortisol
  - Catecholamines
  - Heart Rate
  - Blood Pressure
  - Blood Glucose
  - Blood Lipids
  - Insulin Resistance
  - Respiration
- **Decreases**
  - Digestion/metabolism
  - Serotonin
  - Bone Loss
  - Short Term Memory
  - Growth
  - Hormone
  - Hormone Balance
  - Cellular Immunity
  - Concentration
  - Testosterone

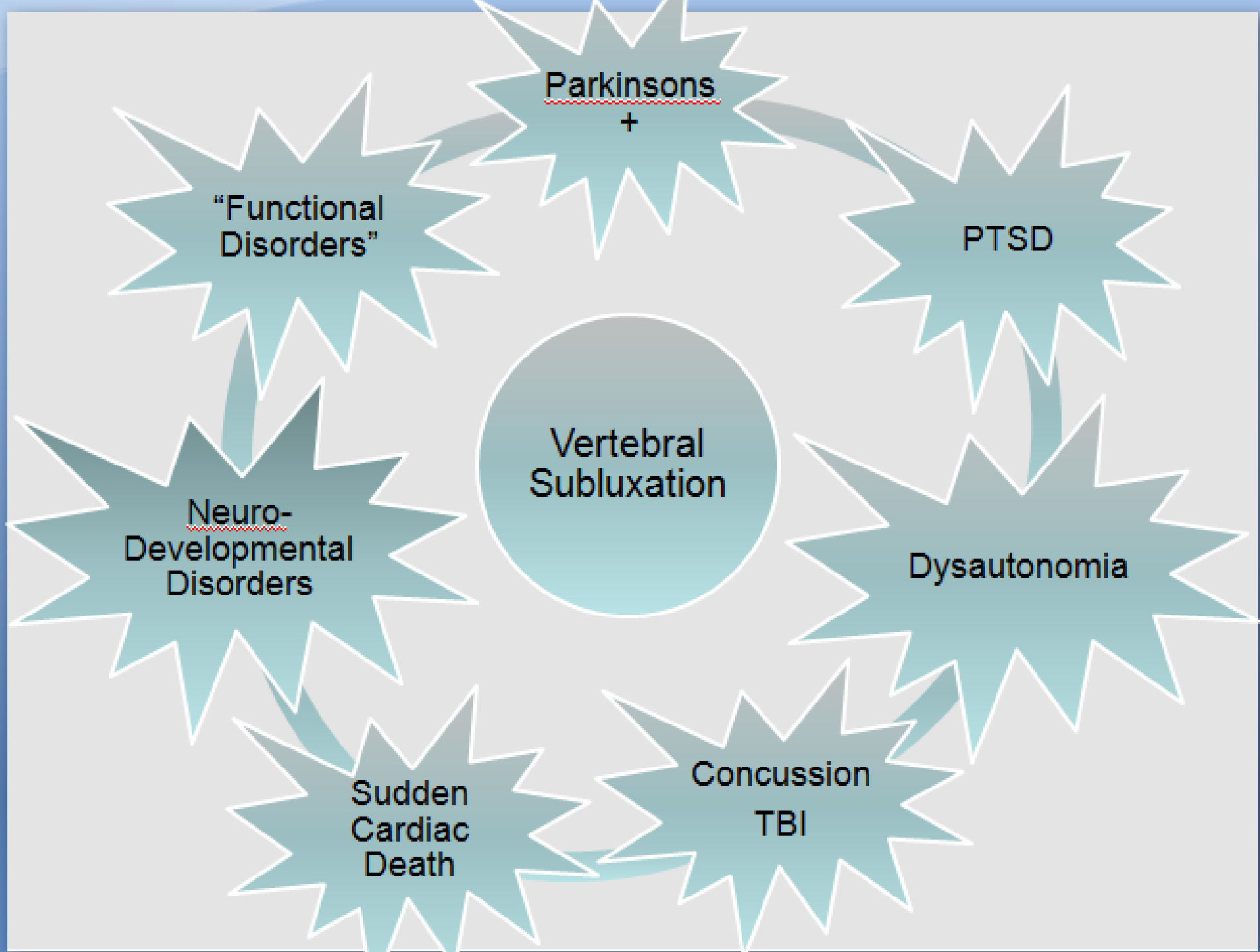
Altered Behavior, Stress & Subluxation

- Anxiety
- Addiction
- Depression
- ADHD
- Relaxation
- Cognitive Function



Foundation for Vertebral Subluxation


Parkinsons
+
"Functional Disorders"
PTSD
STRESS
Neuro-Developmental Disorders
Dysautonomia
Sudden Cardiac Death
Concussion
TBI


Parkinsons
+
"Functional Disorders"
PTSD
Vertebral Subluxation
Neuro-Developmental Disorders
Dysautonomia
Sudden Cardiac Death
Concussion
TBI

Anxiety

Goff et al: Explored the relaxation response as it relates to the correction of subluxation via chiropractic adjustment.

Relaxation response measured through:

EMG potentials
Spinal ROM
Anxiety levels

Goff PJ, McConnell E, Paone P “The Effect of Chiropractic Adjustment on Frontalis EMG Potentials, Spinal Ranges of Motion and Anxiety Level” Chiropractic: The Journal of Chiropractic Research and Clinical Inverstigation 1991; 7(1): 4-9.

Anxiety – Goff et al

Twenty-six adults determined to have a subluxation, “but not having a diagnosis of other clinically significant disorders” were used.

Results indicated a significant change occurred in the chiropractic group as compared to the 23 controls. Adjustments facilitated a considerable decrease in patient muscle tension.



Goff PJ, McConnell E, Paone P “The Effect of Chiropractic Adjustment on Frontalis EMG Potentials, Spinal Ranges of Motion and Anxiety Level” Chiropractic: The Journal of Chiropractic Research and Clinical Inverstigation 1991; 7(1): 4-9.

ORIGINAL RESEARCH

Improvement in Depression Following Reduction of Upper Cervical Vertebral Subluxation Using Orthospinology Technique

Glenndon C. Genthner[†],M.Div., Harris L. Friedman[†],PhD, Charles F. Studley, DC[††]

ABSTRACT

Background: It has been long speculated that chiropractic interventions may affect mental health problems. One such intervention, an Orthospinology technique to correct the occipito-atlantoaxial subluxation complex using the Grostic procedure, has been anecdotally noted to improve depressive symptoms.

Methods: Consequently, 15 adults were selected by their treating chiropractors as both clinically depressed and having an upper cervical subluxation, then treated with this intervention in 3 private practice settings in the southern United States. These participants were administered the Beck Depression Inventory II prior to an a Grostic correction of the upper cervical complex, as well as post-procedurally.

Results: A paired t-test demonstrated significant improvement in depression test scores ($t=3.96$, $df=14$, $p<0.001$).

Conclusions: The data supports the hypothesis that the orthospinology technique to correct the occipito-atlantoaxial subluxation complex using the Grostic procedure may relate to reduced depressive symptoms.

Key words: *Orthospinology, depression, occipito-atlantoaxial subluxation, upper cervical, Grostic, chiropractic*

Introduction

The effects of chiropractic treatment on mental health variables have not been extensively studied, despite the increasingly recognized relationship between mind and body. Historically, interest in chiropractic as a mental health intervention commenced in the early 1920's. At that time, there was great optimism about chiropractic's role in treating such disorders. In fact, two major chiropractic psychiatric hospitals functioned successfully for nearly thirty years in Davenport, Iowa. Unfortunately, both hospitals closed in the 1950's, and most patient documents, including data meant for a seven-year follow-up, were destroyed. W. Heath Quigley, administrator at one of these hospitals in the 1940s, wrote clinical observations suggesting the success of chiropractic treatment on various mental illnesses, and there is some documentation supporting the fact that treatment results in these institutions were as successful, given the times, as those of comparable state psychiatric facilities.[1,2,3] For example, in one report the total admissions for one year was recorded as 72 patients with 39 discharged as "socially restored"—including patients diagnosed with such severe disorders as schizophrenia and psychotic depression.[1]

Since the pioneer days of chiropractic, numerous studies have demonstrated that a plethora of ailments may result when the vertebra are askew—and subsequently improve when they are adjusted[4]. Several of these studies linked chiropractic adjustments to reduction of mental health problems, leading to the formulation of this study's hypothesis, namely that chiropractic orthospinology may benefit individuals suffering from depressive disorders. Kessinger & Boneva, for example, conducted a study reporting significant improvements in neurocognitive function in an upper cervical treated group.[5] Goodman presented a case study of a nine-year-old female with an ADD diagnosis. After treatment of the Occipito-Atlantoaxial Subluxation Complex, symptoms reduced dramatically. She was neither taking prescription medication nor undergoing psychological intervention during the treatment period observed.[6] Similarly, Aguilar, Grostic & Pfleger recently conducted a study that attributed upper cervical adjustment of the atlas to improved functioning in autism.[7] The success of upper cervical care on these disorders suggests that depressive disorders may also benefit from adjustment of the atlas.

One study similar to ours, conducted in 1975 at the Psychoeducational and Guidance Services in College Station, Texas, concluded that chiropractic treatment was effective in reducing symptoms common in a wide range of learning and behavioral dysfunctions, and in fact was 20% to 40% more effective than commonly used medications.[8] Limitations of this study, however, included a small experimental group ($n = 12$), lack of specificity in regards to the chiropractic procedures used, and imprecise descriptions of which part or parts of the spine were adjusted. This study concluded that "chiropractic treat-

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Psychological response in spinal manipulation (PRISM): A systematic review of psychological outcomes in randomised controlled trials

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Available online 8 March 2007

KEYWORDS
Systematic review;
Back pain;
Neck pain;
Spinal manipulation;
Psychological outcome

Summary
Background: The most important risk factors for back and neck pain are psychosocial. Nevertheless, systematic reviews of spinal manipulation have concentrated on pain and spine related disability, and ignored psychological outcomes.
Objective: To assess whether spinal manipulation was effective in improving psychological outcome.
Design: Systematic review of randomised controlled trials (RCTs).
Methods: RCTs were identified by searching Medline, CINAHL, Embase, CENTRAL, AMED, PsycINFO until November 2005. Trials reporting psychological outcomes including the mental health components of generic outcomes were extracted, and combined where appropriate in meta-analyses.
Results: One hundred and twenty nine RCTs of spinal manipulation were identified; 12 had adequately reported psychological outcomes. Six trials with a verbal intervention comparator were combined in a meta-analysis, and found a mean benefit from spinal manipulation equivalent to 0.34 of the population standard deviation (S.D.) [95% confidence interval (CI) 0.23–0.45] at 1–5 months; 0.27 of the S.D. [95% CI 0.14–0.40] at 6–12 months. Eight trials with a physical treatment comparator were combined in a meta-analysis and found a mean benefit of 0.13 of the S.D. [95% CI 0.01–0.24] in favour of manipulation at 1–5 months; 0.11 of the S.D. [95% CI −0.02 to 0.25] at 6–12 months.
Conclusions: There was some evidence that spinal manipulation improved psychological outcomes compared with verbal interventions.
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Introduction

Spinal pain is a common cause of disability and work loss,[1,2] and one of the main reasons for

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ORIGINAL RESEARCH

Changes in Physical State and Self-Perceptions in Domains of Health Related Quality of Life Among Public Safety Personnel Undergoing Chiropractic Care

Wesley McAllister, B.A., D.C.[1] *and W.R. Boone, Ph.D., D.C.*[2]

ABSTRACT

Objective: A pilot study was conducted at Sherman College of Straight Chiropractic, Spartanburg SC, with volunteers primarily from the North Spartanburg Fire and Emergency Services Department. The study was conducted to evaluate the impact of chiropractic care on the physical and self-perceived health related benefits of public safety personnel. Preliminary data regarding their care has been collected and analyzed. Over an average of 5.5 months volunteers received routine chiropractic care at the College Health Center. Each subject was assessed on a weekly basis and adjusted when necessary.

Methods: Physical assessments were conducted on 10 volunteers during the initial visit and at the re-assessment period. As well, a Health Related Quality of Life Survey (HRQL) was completed by each subject at the initial assessment and the following reassessment. Physical assessments included: (a) visual postural analyses (6 tests), (b) cervical range of motion (6 tests), (c) lumbar range of motion (6 tests) (d), spinal balance and leg length (5 tests), (e) orthopedics (19 tests), (f) motor strength (11 tests), (g) deep tendon reflexes (5 tests), (h) superficial reflexes,(3 tests) and (i) sensory testing (14 tests). Positive tests were assigned a numeric of +1 and negative findings a zero. Self-perceptions were also assessed by Cohen's method of determining effect size (ES), or size of the clinical effect.

Results: As a group, the ten volunteers decreased from an average of 16.0 positive findings to 9.5 positive findings, a statistically significant reduction ($p = 0.021$). In addition, volunteers' self-evaluations of HRQL domains included: physical well-being, mental/emotional state, stress management, life enjoyment, and overall quality of life, When tallied together over the average 5.5 months of care, these domains represented a significant change ($p = 0.040$). As well, a 6th domain, referred to as a "wellness index," representing the sum of the 5 domains, was also significantly improved ($p = 0.000$). The ES for improvement in all HRQL domains was large, (0.81 ± 0.44), ranging from 0.35 to 1.30.

Conclusion: The results of this preliminary study revealed that ten volunteers showed significant improvements in physical assessment findings and self perceptions in health related domains while undergoing an average of 5.5 months of chiropractic care. The changes also appeared to elicit a large clinical effect with regard to self-ratings. Further study, including individuals from various areas of public service, will be required to validate these findings.

Key Words: *Chiropractic, public safety personnel, vertebral subluxation*

Introduction

The protective, and often life saving role that public safety personnel fill in the day to day life of global citizens is historically evident. However, governmental support for the safety and advanced training, especially for firefighters, is sorely lacking.[1,2] Moreover, public safety services, to be successful, must be matched to personality types suited to

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J Cancer Surviv (2007) 1:161–166
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Short term correlates of the Neuro Emotional Technique for cancer-related traumatic stress symptoms: A pilot case series

Daniel A. Monti · Marie E. Stoner · Gail Zivin · Martha Schlesinger

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Abstract
Introduction As many as one quarter of all cancer survivors report traumatic stress symptoms from cancer-related experiences. While the majority of these patients do not meet the criteria for posttraumatic stress disorder (PTSD), there is growing evidence that subsyndromal symptoms can significantly contribute to functional impairment and negative health outcomes. Treatment options for the hallmark symptoms of traumatic stress—unpleasant, intrusive thoughts and avoidant behaviors—have not been well investigated for the cancer survivorship population.
Materials and methods Seven female cancer survivors with traumatic stress symptoms from cancer-related experiences and no other major psychopathology, were enrolled to receive three sessions of Neuro-Emotional Technique (NET), a brief, targeted treatment that combines traditional desensitization principles with complementary modalities.
Results Psychological outcome measures (Impact of Event Scale (IES) and Subjective Units of Distress (SUD) and physiological measures (Heart Rate (HR) and Skin Conductance Level (SCL) demonstrated the following changes: 71% on IES, 88% SUD, 74% on HR, and 65% on SCL following the intervention. Statistically significant changes were observed for all four parameters, and effect size *g* for proportion improved were 0.50 each for IES, SUD, and HR, and 0.20 for SCL.
Conclusions These cases suggest feasibility of the NET intervention for cancer-related traumatic stress and the potential for change in symptoms and physiological reactivity. Further investigation is needed to determine the specific and long-term effects of such an approach.
Implications for cancer survivors Traumatic stress from cancer-related experiences might represent a constellation of symptoms that are amenable to brief, targeted interventions.

Keywords Cancer survivors · Neuro Emotional Technique · NET · Traumatic stress · Distressing recollections · Brief psychotherapy

Introduction

Receiving a cancer diagnosis can be a highly stressful event and the cancer illness experience adds many stressors. It is well documented that stress can contribute to negative health outcomes in cancer survivors; hence, addressing stress has become a priority issue in cancer treatment and research [19].

Traumatic stress refers to a category of conditions where a particular life threatening event or series of events causes ongoing distress beyond a certain time period from the original occurrence of the event or events. Approximately one-fourth of all cancer survivors suffer from traumatic stress symptoms [15]. However, only a minority (3–10%) of these patients meets the criteria for posttraumatic stress disorder [1]. Therefore, the literature has referred to the most common manifestation of traumatic stress in cancer patients as "distressing recollections" of cancer-related expe-

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Foundation for Vertebral Subluxation

Chiropractic and Mental Health: History and Review of Putative Neurobiological Mechanisms

Christopher Kent, DC, JD[1]

Abstract

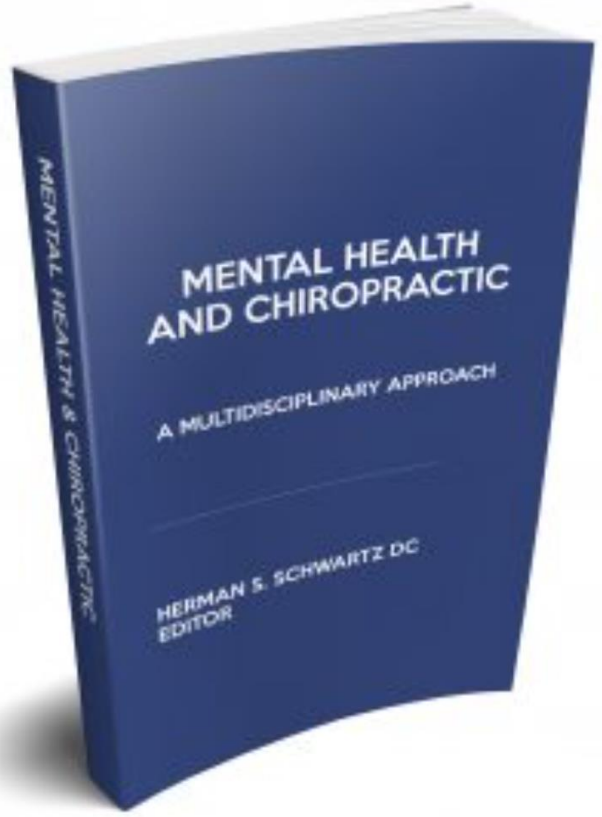
The chiropractic profession has a long history of acknowledging the relationship between nervous system function and mental health. This paper reviews the history of chiropractic involvement in mental health issues, chiropractic institutions specializing in the care of mental health problems, and the putative neurobiological mechanisms associated with vertebral subluxation and dysregulation of the autonomic nervous system.

Key words: *Chiropractic, history, mental health, vertebral subluxation, manipulation, depression, anxiety, addiction, hospitals, autonomic nervous system, biological oscillators, neuroplasticity, polyvagal theory, neurovisceral integration, heart rate variability, resiliency, adaptability, salutogenesis*

Introduction

Musculoskeletal conditions are the predominant reason persons seek chiropractic care. The top five reported reasons for attending chiropractic care are low back pain/back pain, neck pain, extremity problems, wellness/maintenance and hip pain. The top five reasons for pediatric cases to attend chiropractic care are musculoskeletal conditions, excessive crying, neurological conditions, gastrointestinal conditions, and ear, nose, and throat conditions [1]. Although many chiropractors and those they serve tend to focus on disorders associated with the physical body, abnormal nervous system function may also affect emotional and psychological health. The author completed a brief historical overview of

vertebrae, that by replacing them the patient could be restored to normal condition" [4]. B.J. also described his expert testimony in a case where he stated, "If an atlas is subluxated it makes abnormal the functions of the brain." In answer to the question, "What is to be done in insanity?" he admonished his reader to "Go back to cause. Adjust that and return that brain to its normal capacity and capability" [5]. Another pioneer in the field of mental health and chiropractic was attorney and chiropractor Willard Carver. Carver authored the book, Pyscho-Bio- Physiology, and wrote, “Between the Psychology and the Physiology I have built the Biologic bridge that scientifically connects these two very important departments

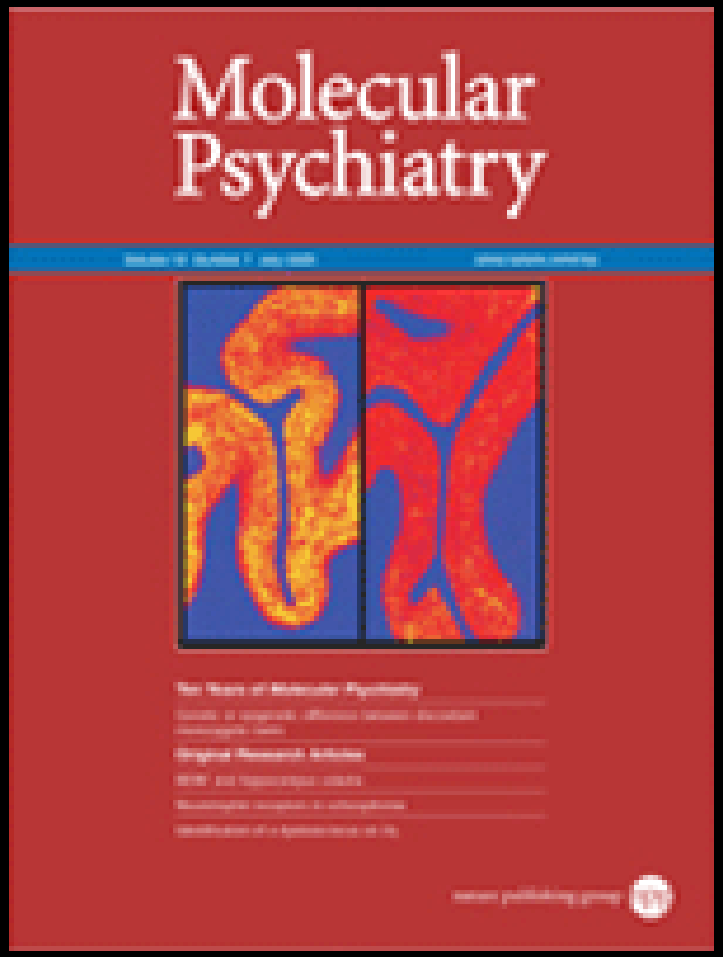

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Brains & Subluxation



Foundation for Vertebral Subluxation

Brain Reward Cascade



Original Research

P300 Wave Outcomes in Subluxation Based Chiropractic in Residential Addiction Treatment: A Randomized Controlled Clinical Trial

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Abstract

Objective: Research is needed to determine if P300 wave analysis has significance as an outcome assessment of subluxation-based chiropractic care in the addiction treatment setting.

Methods: Two groups of male subjects in residential addiction treatment are studied for 90 days. The chiropractic group received chiropractic adjustments using Torque Release Technique® and the Integrator® adjusting instrument three times per week. The Placebo group received a sham adjustment three times per week. Both groups were assessed with the Beck's Depression Inventory and the Speilberger State-Trait Anxiety Questionnaire at intake and every 30 days. P300 analysis was taken at intake and every week for both groups.

Results: In the chiropractic group; depression scores improved by 97%, anxiety scores improved by 36.5% with 100% retention rate in the chiropractic group and 0% retention rate in the Placebo group. P300 wave results improved in the chiropractic group.

Conclusions: We conclude that chiropractic care utilizing the Torque Release Technique® improves retention rates, psychosocial inventory assessments and prevents relapse. More research is warranted to determine the significance in the use of the P300 wave as an outcome strategy in chiropractic intervention. Subluxation-based chiropractic care should be considered as standard care in the management of addicted individuals.

Key Words: *P300, Depression, Anxiety, Addiction, ADHD, Electroencephalography, Torque Release Technique®, Subluxation, Adjustment, Chiropractic, Integrator®*

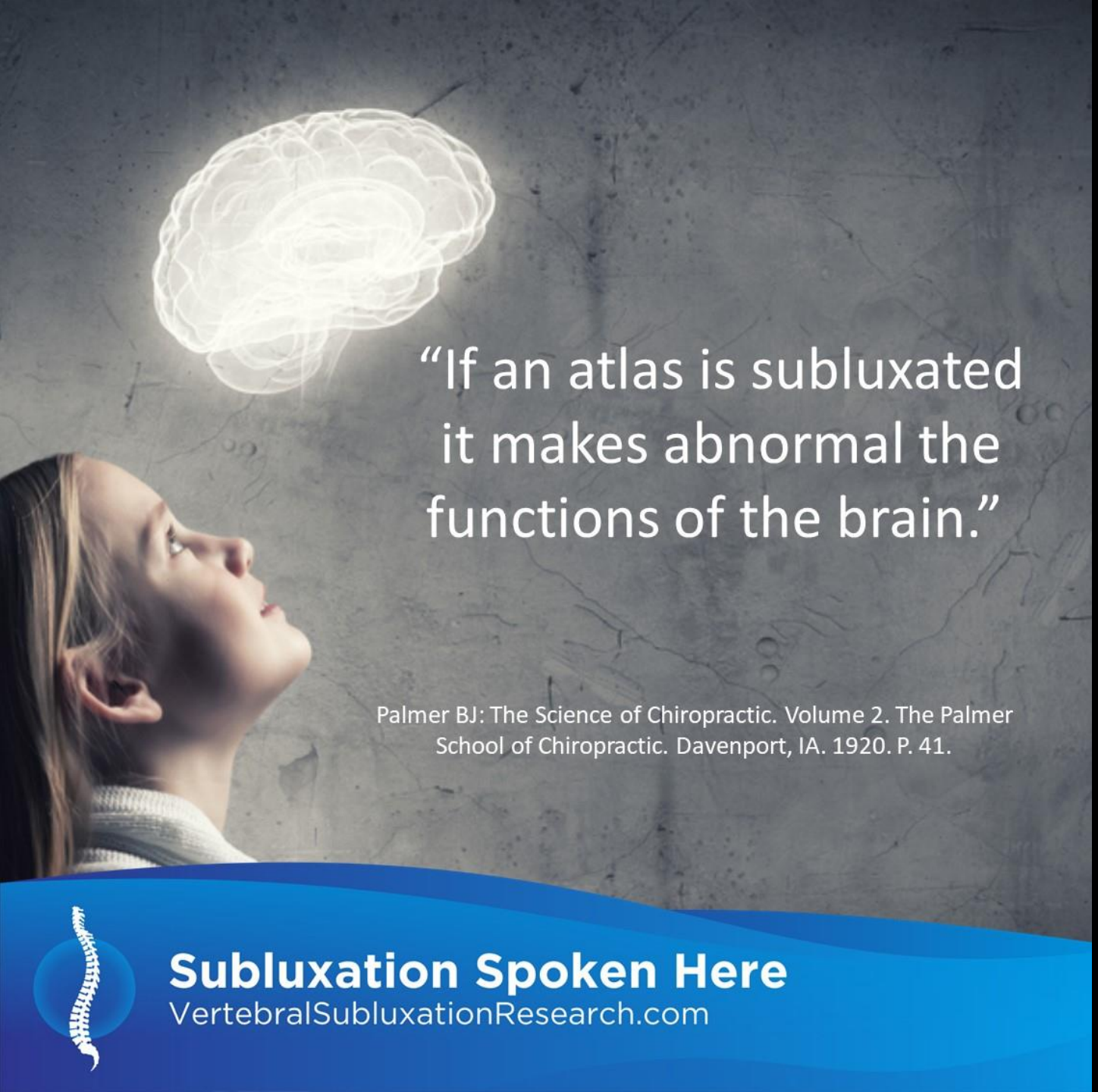
Introduction

The nature of this study was to determine 1) if use of the P-300 wave has significance as an outcome assessment in the addiction treatment setting, 2) if use of the P-300 wave has significance as an outcome assessment of subluxation based chiropractic care, and 3) if the use of the P300 wave has significance as a biofeedback tool.

We hypothesized that P300 amplitude and latency will normalize with chiropractic intervention and positively correlate with favorable health and addiction outcomes including depression scores and anxiety scores. We hypothesized that P300 amplitude and latency will be more reluctant to normalize in the Placebo group and unfavorable health and addiction outcomes will be reflected.

The P300 wave appears on an electroencephalograph approximately 300ms after a stimulus. The P300 is composed of several parts that reflect an information-processing cascade when attentional and memory mechanisms are engaged.

The P300 is a correlate of neurocognitive function, meaning that conclusions can be drawn regarding a subject's cognitive processes by assessing his or her P300 wave characteristics.


"If an atlas is subluxated it makes abnormal the functions of the brain."
Palmer BJ: The Science of Chiropractic. Volume 2. The Palmer School of Chiropractic. Davenport, IA. 1920. P. 41.
Subluxation Spoken Here
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The Reality Check
April 12 at 9:02pm ·

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Our resent study is getting a lot of attention. We will have to do an animation about it 🙂 Want to read more:
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Neural Plasticity
Volume 2016, Article ID 3704964, 9 pages
http://dx.doi.org/10.1155/2016/3704964

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Research Article

Manipulation of Dysfunctional Spinal Joints Affects Sensorimotor Integration in the Prefrontal Cortex: A Brain Source Localization Study

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Original Research

The Effects of Chiropractic Spinal Adjustment on EEG in Adults with Alzheimer's and Parkinson's Disease: A Pilot Randomised Cross-over Trial

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Academic Editor: Yoshihiro Noda
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Abstract

Objectives: In this study, we explored the effects of chiropractic spinal adjustments on resting-state electroencephalography (EEG) recordings and early somatosensory evoked potentials (SEPs) in Alzheimer's and Parkinson's disease. **Methods**: In this randomized cross-over study, 14 adults with Alzheimer's disease (average age 67 $\pm$ 6 years, 2 females:12 males) and 14 adults with Parkinson's disease (average age 62 $\pm$ 11 years, 1 female:13 males) participated. The participants underwent chiropractic spinal adjustments and a control (sham) intervention in a randomized order, with a minimum of one week between each intervention. EEG was recorded before and after each intervention, both during rest and stimulation of the right median nerve. The power-spectra was calculated for resting-state EEG, and the amplitude of the N30 peak was assessed for the SEPs. The source localization was performed on the power-spectra of resting-state EEG and the N30 SEP peak. **Results**: Chiropractic spinal adjustment significantly reduced the N30 peak in individuals with Alzheimer's by 15% (p = 0.027). While other outcomes did not reach significance, resting-state EEG showed an increase in absolute power in all frequency bands after chiropractic spinal adjustments in individuals with Alzheimer's and Parkinson's disease. The findings revealed a notable enhancement in connectivity within the Default Mode Network (DMN) at the alpha, beta, and theta frequency bands among individuals undergoing chiropractic adjustments. **Conclusions**: We found that it is feasible to record EEG/SEP in individuals with Alzheimer's and Parkinson's disease. Additionally, a single session of chiropractic spinal adjustment reduced the somatosensory evoked N30 potential and enhancement in connectivity within the DMN at the alpha, beta, and theta frequency bands in individuals with Alzheimer's disease. Future studies may require a larger sample size to estimate the effects of chiropractic spinal adjustment on brain activity. Given the preliminary nature of our findings, caution is warranted when considering the clinical implications. **Clinical Trial Registration**: The study was registered by the Australian New Zealand Clinical Trials Registry (registration number ACTRN12618001217291 and 12618001218280).

Keywords: chiropractic; Parkinson disease; Alzheimer disease; electroencephalography; somatosensory evoked potentials; brain waves; spinal adjustment

The reduction in the amplitude of the N30 peak:

1. Normalization of Brain Activity: In neurological conditions, abnormal increases in the amplitude of evoked potentials can reflect dysfunctional neural processing. A reduction in the N30 peak might indicate a return towards more normal neural activity patterns.

2. Improved Neural Efficiency: Lower amplitudes in certain contexts can suggest that the brain is processing sensory information more efficiently, requiring less overall neural effort to achieve the same functional outcomes.

3. Reduced Hyperexcitability: In conditions like Alzheimer's, certain neural circuits might become hyperexcitable, leading to exaggerated responses. Reducing the N30 amplitude might imply that the chiropractic adjustment helps to calm these overactive pathways, potentially reducing symptoms related to sensory processing abnormalities.

4. Potential Therapeutic Effects: If the reduction in N30 peak amplitude correlates with improvements in symptoms or cognitive function, it could suggest that chiropractic adjustments might have therapeutic benefits for patients with Alzheimer's disease.

Increased Absolute Power in EEG Frequency Bands

1. Resting-State EEG: This refers to the brain's electrical activity when a person is at rest, not engaged in any specific task. It provides a baseline measure of brain function.

2. Frequency Bands: EEG signals are divided into different frequency bands, each associated with different types of brain activity:

- Delta (0.5-4 Hz): Often linked to deep sleep and restorative processes.
- Theta (4-8 Hz): Associated with drowsiness, light sleep, certain aspects of learning & memory.
- Alpha (8-12 Hz): Linked to relaxation, calmness, and inhibition of unnecessary neural activity.
- Beta (12-30 Hz): Related to active thinking, focus, and problem-solving.
- Gamma (>30 Hz): Associated with high-level cognitive processing and consciousness.

3. Absolute Power: This refers to the strength or amplitude of the EEG signal within each frequency band. Increased absolute power means there is more electrical activity in these frequency ranges.

Why This Might Be a Good Thing

1. **Enhanced Neural Communication:** Increased power in various frequency bands may indicate improved communication and synchronization among different regions of the brain. This could lead to better overall brain function.

2. **Improved Cognitive Function:** Higher power in alpha and beta bands, for instance, has been associated with enhanced cognitive processes such as attention, memory, and information processing. This could potentially translate to cognitive benefits for individuals with neurodegenerative conditions like Alzheimer's and Parkinson's disease.

3. **Balancing Brain Activity:** In many neurological disorders, there is an imbalance in the activity across different frequency bands. For example, individuals with Alzheimer's often show reduced alpha power. Increasing power across all bands might help to restore a more balanced and functional neural network.

4. **Neuroplasticity:** Increased EEG power might reflect underlying changes in brain plasticity, meaning the brain's ability to adapt and reorganize itself. This could be a sign of the brain trying to compensate for the deficits caused by neurodegenerative diseases.

5. **Potential Therapeutic Effects:** If chiropractic adjustments are found to consistently increase EEG power across frequency bands, this could suggest a non-invasive method to support brain health and function in individuals with Alzheimer's and Parkinson's disease.

ORIGINAL RESEARCH

Cerebral Metabolic Changes in Men After Chiropractic Spinal Manipulation for Neck Pain

Takeshi Ogura, DC, PhD; Manabu Tashiro, MD, PhD; Mehedi Masud, MD, PhD; Shoichi Watanuki; Katsuhiko Shibuya, MS; Keiichiro Yamaguchi, MD, PhD; Masatoshi Itoh, MD, PhD; Hiroshi Fukuda, MD, PhD; Kazuhiko Yanai, MD, PhD

Abstract

Background • Chiropractic spinal manipulation (CSM) is an alternative treatment for back pain. The autonomic nervous system is often involved in spinal dysfunction. Although studies on the effects of CSM have been performed, no chiropractic study has examined regional cerebral metabolism using positron emission tomography (PET).

Objective • The aim of the present study was to investigate the effects of CSM on brain responses in terms of cerebral glucose metabolic changes measured by [^{18}F]fluorodeoxyglucose positron emission tomography (FDG-PET).

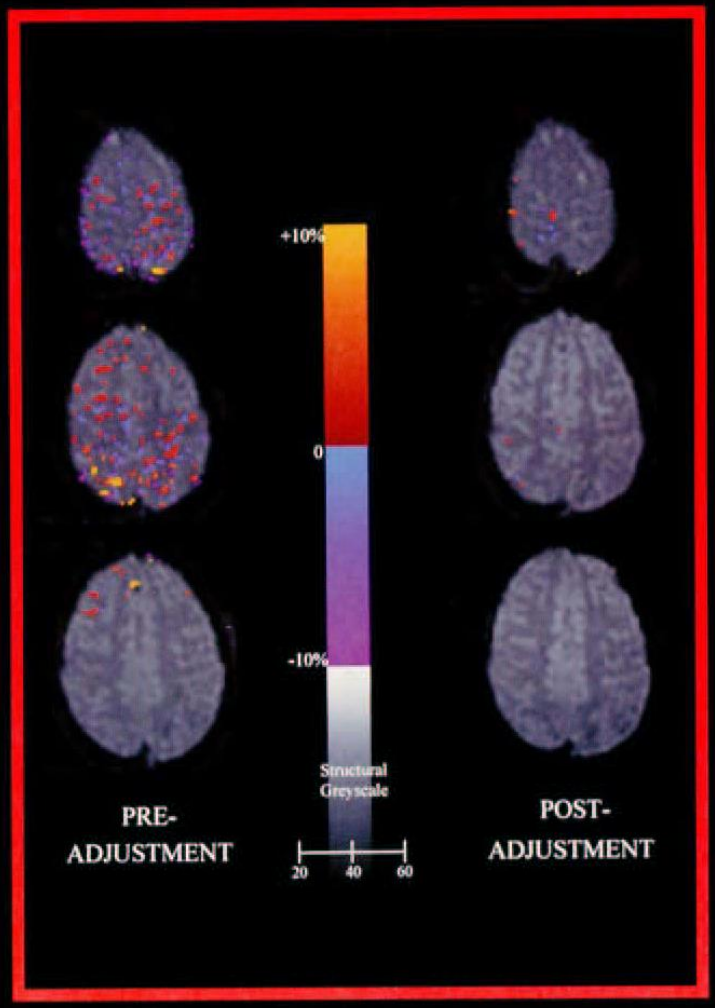
Methods • Twelve male volunteers were recruited. Brain PET scanning was performed twice on each participant, at resting and after CSM. Questionnaires were used for subjective evaluations. A visual analogue scale (VAS) was rated by participants before and after chiropractic treatment, and muscle tone and salivary amylase were measured.

Results • Increased glucose metabolism was observed in the inferior prefrontal cortex, anterior cingulated cortex, and middle temporal gyrus, and decreased glucose metabolism was found in the cerebellar vermis and visual association cortex, in the treatment condition ($P < .001$). Comparisons of questionnaires indicated a lower stress level and better quality of life in the treatment condition. A significantly lower VAS was noted after CSM. Cervical muscle tone and salivary amylase were decreased after CSM.

Conclusion • The results of this study suggest that CSM affects regional cerebral glucose metabolism related to sympathetic relaxation and pain reduction. (*Altern Ther Health Med.* 2011;17(6):12-17.)

Journal of
Vertebral Subluxation Research

A PEER-REVIEWED JOURNAL • VOL. 2, NO. 1, 1998



Functional Magnetic resonance Imaging (fMRI), measures the relative presence of oxy-hemoglobin. This technology may provide a useful assessment of cortical changes following chiropractic intervention.

Images of the patient depicted on the cover, on the left, reflect cortical activity (lighted areas in the parietal cortex, frontal cortex areas 9, 10; visual association areas 19, 37, and 39) associated with the learning process of a "novel" muscular maneuver of the foot.

Images on the right reflect cortical activity following a Network Spinal Analysis adjustment session, taken approximately 20 minutes after the first set of images, involving the same activity.

The decrease in "lighted" areas before and after the adjustment session suggests that less cortical "planning" or "activity" is associated with the "novel" foot maneuver.

The ability of fMRI to visualize changes in cortical activity may play a significant role in elucidating the consequences of vertebral subluxation correction on neurological function.

Cognitive Function

Kessinger and Boneva demonstrated significant improvements in neurocognitive function in 30 subjects receiving 4 weeks of upper cervical care compared to 10 control subjects who did not demonstrate a similar trend.

Cognitive function was measured via the computer administered and scored test, Microcog.

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Cognitive Function - Kessinger

Microcog measures:

- Attention/mental control
- Memory
- Reasoning/calculation
- Spatial processing
- Reaction time
- Information processing speed
- Information processing accuracy
- General cognitive functioning
- General cognitive proficiency

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Cortical Processing

Kelly, Murphy, and Backhouse:

Utilized a mental rotation reaction-time paradigm to assess changes in cortical processing following chiropractic adjustments.

Thirty-eight volunteers were tested in this study. The average decrease (improvement) in reaction time for the experimental group was 14.9%. The control group improvement of only 8% was attributed to a learning curve effect. The study demonstrated a small but statistically significant improvement in cognitive function after a single adjustment.

Foundation for Vertebral Subluxation

Chiropractic Theory

According to Melillo and Leisman, childhood neurobehavioral disorders have many features in common:

“Attention deficit disorder (ADD), attention deficit hyperactive disorder (ADHD), pervasive developmental disorder (PDD), obsessive compulsive disorder (OCD), Asperger’s syndrome, and Autism to name but a few, may be viewed as points on a spectrum of developmental disabilities in which those points share features in common and possibly etiology as well, varying only in severity and in the primary anatomical region of dysfunctional activity.”

Chiropractic Theory

Melillo and Leisman outline a theory “…of developmental disabilities in evolutionary terms…” and argue that the move to bipedalism is responsible for the development and evolution of the human neocortex and the comparatively large human brain.

Postural muscles being the main conduit by which motor and cognitive binding evolve means that abnormalities in postural development or activity may disrupt cerebellar and cortical maturation.

Chiropractic Theory

They add to this a relationship between cognition and motor functions and the suggestion that the same mechanisms enabling coordinated movements also affect sophisticated cognitive processes.



The authors assert that motor incoordination and disruptions in executive functions are a common thread in most developmental disorders.

The alterations in executive functioning stem from the inability to bind motor and cognitive functions, resulting from understimulation of the cerebellum and thalamus.

Chiropractic Theory

Further, region specific brain effects result from a dysfunction of hemisphericity whereby there is a failure to achieve equal activity between the left and right hemispheres.

The authors propose that the cause of this chain of events is fundamentally an environmental one involving the more recent increase in sedentary childhood behaviors.

Treatment, according to these authors, should focus on improving motor performance along with cognitive training and behavior modification.

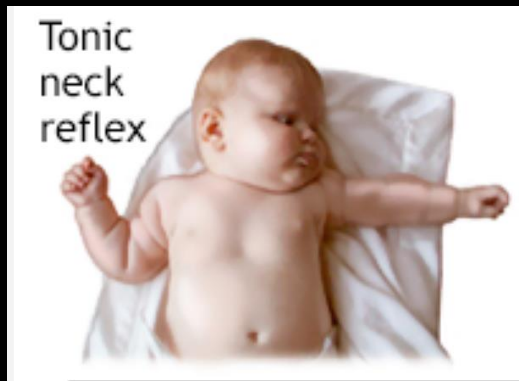


Melillo R, Leisman G. Introduction *in* Neurobehavioral Disorders of Childhood. An Evolutionary Perspective. 2004 Kluwer Academic/Plenum Publishers. New York.

Retained Primitive Reflexes

The in-utero emergence and organization of a set of ‘primitive’ (i.e., brainstem level) reflexes allows infants to perform several automatic, survival-oriented functions during their first year of life. With normal development, these primitive reflexes are progressively integrated back into the brainstem and superseded by postural reflexes and volitional cortical functions.

If primitive reflexes are ‘retained’ (i.e., not integrated) beyond the normal developmental period, then these ‘Retained Primitive Reflexes’ (RPRs) can adversely affect a child’s maturation process, interfere with their cortical brain’s ability to develop sensory processing skills, and/or delay development of bipedal posture, socialization, and learning.



Reflex	Age & Purpose	How to Test	Symptoms if Retained	Recommended Exercises
Tonic Labyrinthine Reflex (TLR) – Forwards	- Utero-4 months - Response to gravity - Helps to straighten out from a flexed position	- Stand with feet together, eyes closed - Slowly and passively tilt head into flexion and hold for 10 seconds, then into extension for 10 seconds - Repeat 6 times (+) Swaying	- Delayed walking - Toe walking - Poor posture - Car or motion sickness - Poor sense of balance - Hypotonic - Visual perceptive difficulties - Dislikes sporting activities - Poor sequencing skills and sense of time	- Meatball for 15 seconds, 10 times, 3 times daily for 30 days - Superman for 15 seconds, 10 times, 3 times daily for 30 days
Tonic Labyrinthine Reflex (TLR) – Backwards	- Birth-3 years - Response to gravity	- Stand with feet together, eyes closed - Slowly and passively tilt head into flexion and hold for 10 seconds, then into extension for 10 seconds - Repeat 6 times (+) Swaying	- Delayed walking - Toe walking - Poor posture - Car or motion sickness - Poor sense of balance - Poor coordination - “Growing pains” in legs; shortening of hamstrings and Achilles	- Meatball for 15 seconds, 10 times, 3 times daily for 30 days - Superman for 15 seconds, 10 times, 3 times daily for 30 days
Asymmetrical Tonic Neck (ATNR)	- Utero-4-6 months - Corkscrew motion to initiate rotation to exit the birth canal * Most commonly observed retained primitive reflex	- Stand with feet shoulder-width apart, shoulders flexed to 90°, hands and wrists relaxed - Instruct child to maintain position of arms while slowly and passively rotating the head for 10 seconds, then to the other side for 10 seconds - Repeat 4 times (+) Arm drop, movement of arms	- Mixed laterality or ambidexterity - Poor hand-eye coordination - Poor distant vision - Poor horizontal eye tracking, difficulty reading and writing - Poor upper/lower limb and body coordination - Poor motor skills, balance - Poor at sports	- Lizard exercise 10 times, 3 times daily for 30 days
Moro	- Utero-2-4 months - Produces cortisol and adrenaline to help activate the birth process - Triggers first breath and prompts infant to straighten out after months	Supine: - Bring patient’s head into flexion and tell them you are going to quickly lower it - As the head is being lowered, instruct the patient to bring their arms in across their chest Standing: - Trust fall with arms crossed (+) Increased HR, flailing of arms	- Poor balance and hand-eye coordination - Car and motion sickness - Sensitivity to bright lights, tires easily under lights - Difficulty reading black print on white paper - Hypersensitive to touch and loud noises - Easily distracted - Dislike of change - Allergies, poor immunity, autoimmunity	- Starfish exercise 10 times, 3 times daily for 30 days

Reflex	Age & Purpose	How to Test	Symptoms if Retained	Recommended Exercises
Rooting	- Utero-3-4 months - Activates movements to allow sucking and swallowing	- Brush along cheek and jaw three times (+) Facial twitching, turning towards brush	- Immature muscle development of mouth and tongue - Poor swallowing and feeding - Picky eater - Immature digestive system - Difficulty with speech, articulation, and dexterity - Dribbling beyond toddler age - Need for orthodontic treatment - Separation anxiety	- Brush along cheek and jaw 10 times, 3 times daily for 30 days
Palmar	- Utero-2-3 months - Replaced by pincer grip - Activated with sucking reflex - Causes hands to knead the breast to facilitate feeding	- Brush along palm and fingers in vertical and horizontal lines (+) Finger movements or twitching	- Poor handwriting and pencil grip - Poor speech - Poor fine muscle control - Hypersensitive palms - Moves mouth and/or tongue when doing activities involved with hands	- Stroke palms with a paint brush 15-30 times three times daily for 30 days - Squeeze a ball with entire hand 10 times, squeeze all five digits one at a time
Babinski	- Birth-24 months - Assists in commando crawling - Determines adequacy of CNS	- Stroke dorsum of foot from lateral heel to great toe (+) Extension of toes	- Lack of grounding and stability Difficulties with gross and fine motor coordination - Passive in decision making and communication - Presence may suggest a brain or spinal cord problem	- Stroke dorsum of foot with a blunt object 15-30 times twice daily for 30 days - Roll on a Rock Ball or textured side of a stability disc
Spinal Galant	- Utero-6-9 months as infant begins crawling - Encourages hip movement and development to allow crawling and walking	- Patient quadruped - Stroke left and right paraspinals (+) Moving upper torso or pelvis	- Enuresis - IBS - Fidgeting / wiggly butt syndrome - Unable to sit up straight - Ticklish - Dislikes elastic waistbands or labels - Poor concentration and short-term memory - Homolateral movements with walking, marching - Poor mobility in sports - Low back pain - Shallow breathing and constrained vocal tone - Sexual dysfunction	- Snow angels 10 times, 3 times daily for 30 days
Symmetrical Tonic Neck (STNR)	- 6-9 months-9-11 months - Helps defy gravity by getting up off the floor and in the prone position onto hands and knees - Helps to inhibit TLR	- Patient quadruped - Passively flex patient's head (+) Flexing hips - Passively extend patient's head (+) Flexing elbows	- Bear walking or crab crawling - Shuffling on bottom - Uncomfortable sitting in one position - Poor posture - Simian walk - "W" sitting - Poor hand-eye coordination - Slow at copying tasks	- Stretching cat / child's pose - Cat/Cow - Bird dog

Brain Development and How Chiropractic Can Help

So Many Children & Families Suffering Unnecessarily



COHERENCE
THROUGH CHIROPRACTIC

VertebralSubluxationResearch.com

Improved Brain Development in 37 Children Undergoing Chiropractic Care for Correction of Vertebral Subluxation: A Retrospective Analysis of Health Outcomes

Sarah Hock, DC, CACCP[1] & Amy Spoelstra, DC[2]

Abstract

Objective: To describe the care and outcomes of subluxation-based chiropractic care for several children with Neuro-Deflective Disorders™ associated with development.

Clinical Features: Chiropractic care of children with Neuro-Deflective Disorders™ via subluxation-based chiropractic care using neurological, developmental, functional, structural, and subjective parental outcome assessments.

Interventions and Outcomes: Vertebral subluxations when found at specific spinal segments were adjusted. During care, patient outcomes were measured via both objective and subjective measurements for initial and re-evaluation purposes. At the conclusion of each care plan patients' outcomes showed marked improvement in both objective and subjective measurements demonstrating improvement in the quality of life for these patients.

Conclusion: Chiropractic adjustments, which focus on the reduction of vertebral subluxation, appeared to be beneficial for children with Neuro-Deflective Disorders™. When measuring and assessing quality of life for these patients and families there was a positive correlation between chiropractic care and improvement in measured areas.

Key words: *Subluxation, adjustment, pediatric, Neuro-Deflective Disorders™, development, neurodevelopmental disorders*

Introduction

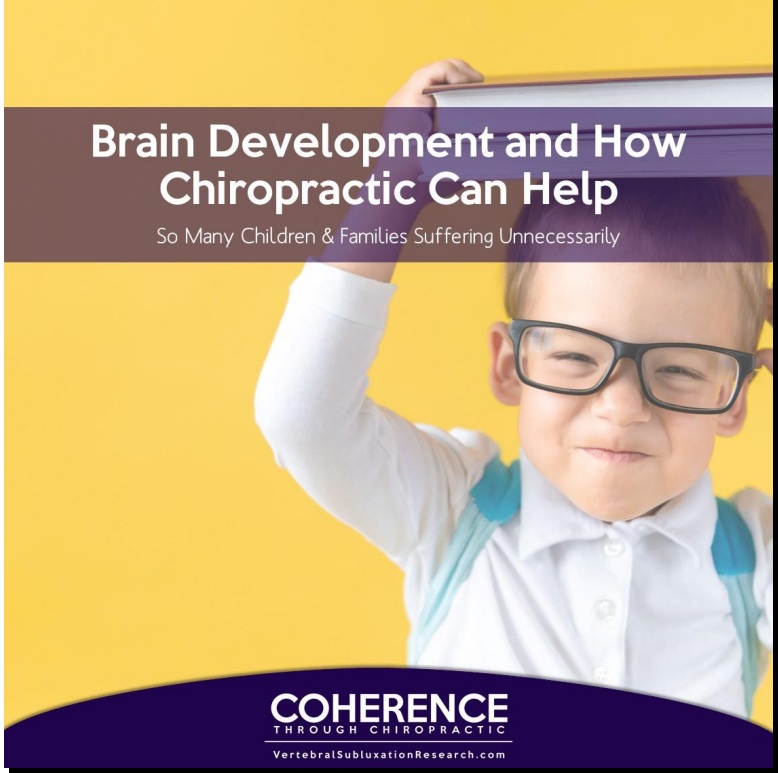
In this study we address two main questions both initially and as a continuous outcome assessment measure. We want to collect data to determine if there are clinical indicators demonstrating alterations in input, processing, and output as it relates to a communication between the brain and the body. We are also interested in assessing the tools in which a person is primarily skilled in, to process their world and how that relates to their ability to efficiently engage, connect, and learn from their environment in a sophisticated way.

In this study we collected outcomes associated with development and processing in pediatric patients.

We know that subluxation can alter input, increasing afferent input to the nervous system, lowering adaptive thresholds, and creating hypersensitivity to "normal" stimuli. Altering input thus alters output; it is logical to think that this change in output can be measured via the functionality of the nervous system and, in this study, developmental skills and how the body interacts with the external environment.[1]

Chiropractic is founded on the assessment and correction of interference in the communicative neurology between the

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2. Private Practice of Chiropractic, Coeur d'Alene, ID





Brain Development and How Chiropractic Can Help

So Many Children & Families Suffering Unnecessarily

Recent research reported in the ***Journal of Pediatric, Maternal & Family Health – Chiropractic*** on children with a number of challenges that share their origin with delayed brain development show that chiropractic benefits these children.

Research is revealing that there is a relationship between abnormalities in the spine, the nervous system and brain with basic science research showing that the proper development and function of the brain relies on proper structure and movement of the spine from an early age.

Research has shown not only that the brain relies on normal structural integrity and joint movement, but that complex neurological communication and pathways involved in helping humans balance and orient themselves in space as well as develop socially, are tied into spinal biomechanics and their related neurological pathways.

We are now seeing more and more basic science and clinical research showing the relationship between abnormal spinal function and the diagnosis of all types of developmental delays. In older children the situation becomes worse due to a huge increase in sedentary behavior in children.

Researchers believe that the increase in the diagnosis of learning disorders, ADHD, pervasive developmental disorder, Tourette's Syndrome, obsessive compulsive disorder and other neurodevelopmental challenges, have their root in a "perfect storm" of abnormal spinal development coupled with cultural changes.

In a recently published study researchers Sarah Hock, DC, CACCP & Amy Spoelstra, DC report on their research that included 37 children with what they refer to as "Neuro-Deflective Disorders". Such disorders according to the researchers impact how children develop to engage, learn, and connect with their environment and this leads to less efficient responses being used by them.

In the clinical study, the researchers examined these children and found structural shifts along their spines. These findings were confirmed by neurological and functional assessments that measure the health of the nervous system. Research has already shown that these structural shifts can lead to obstruction of the nerves, and it is this obstruction, called *vertebral subluxations*, that chiropractors correct.

Once these subluxations were identified the researchers provided chiropractic care and used the same assessments to monitor progress. They also collected data on the quality of life of these children from the parents. The outcome assessments showed improvement in learning, social skills and interpersonal skills, sensory integration, and overall health. These improvements occurred along with reductions in the vertebral subluxations in their spines.

The study's authors called for additional research to further investigate the clinical implications of chiropractic in this population.

Reference:
Improved Brain Development in 37 Children Undergoing Chiropractic Care for Correction of Vertebral Subluxation: A Retrospective Analysis of Health Outcomes. Sarah Hock, DC, CACCP & Amy Spoelstra, DC. Journal of Pediatric, Maternal & Family Health, Chiropractic – October 3, 2022 – Pages 86-94



Brain Function & Chiropractic - FACTS

Research is revealing that there is a relationship between abnormalities in the spine, the nervous system, and the brain.

Basic science and clinical research shows that the proper development of the brain relies heavily on proper structure and movement of the spine from an early age.

Research has shown not only that the developing brain relies on normal structural integrity and joint movement, but that complex neurochemical communication and pathways involved in helping humans to "feel good" are tied into spinal biomechanics and their related neurological pathways.

Neurodevelopmental challenges may be related to how the entire body communicates with the brain and the most critical area for this is the spine.

Researchers believe that the increase in the diagnosis of such disorders as autism, ADHD, pervasive developmental disorder, Tourette's Syndrome, obsessive compulsive disorder and other neurodevelopmental disorders, have their root in a "perfect storm" of abnormal spinal development.

People's nervous systems need the constant stimulation of movement in order to develop and function properly – especially from the spine. Abnormal position or movement of the spinal vertebra can develop and result in structural shifts that lead to nerve obstruction. It is this obstruction, called vertebral subluxations that chiropractors correct.

Chronic problems tend to arise when vertebral subluxations are left uncorrected. By reducing the subluxations, chiropractic improves nerve flow and function. The chiropractic adjustment is the means by which the subluxations are reduced and it is a safe, specific force applied to spinal joints.

Table 1.

Parent Survey Outcomes	Total # Pt "Y"	# "B"1st/2nd/3rd/4th Re-Eval	Avg % "B" over Care Plan	Avg % "U" or "W" over Care Plan
Getting to Sleep	23	12/9/4/1	52.92	18.18
Quality of Sleep	23	9/8/6/0	57.89	29.55
Amount of Sleep	20	6/8/4/0	50.00	25.00
Limited Food Choices	21	4/8/5/2	60.95	26.19
Eating Habits	24	9/8/4/1	66.88	18.75
Digestive Health Overall	22	5/10/5/2	62.04	21.43
Frequency Of Bowel Movnts	11	2/3/2/0	31.89	27.27
Feelings about School	25	9/12/3/2	66.65	20.00
Ease with completing homework	21	10/8/3/2	77.29	14.29
Ability to concentrate on a task/goal	30	14/8/5/1	76.36	15.52
Handwriting	17	10/8/0/0	62.75	11.76
Reading comprehension	19	8/12/2/1	71.39	13.89
Organization/Planning	27	11/11/3/2	64.09	19.23
Spelling	13	3/6/0/0	42.50	29.17
Understanding Concepts	17	5/11/5/2	78.51	11.76
Vocabulary and Expression	21	11/11/4/2	70.04	14.29
Attention/Focus	28	17/17/5/1	76.72	14.81
Academic Performance/Grades	15	9/6/2/2	71.67	13.33
Participation in Extra Curr. Activities	17	8/7/3/2	70.10	17.65
Relationship with Peers	24	12/13/5/2	74.46	17.39
Sensory Sensitivity	27	16/16/7/2	83.00	14.81
Mood (Self-esteem)	33	23/20/6/2	83.41	10.94
Anxiety	31	21/18/4/2	71.88	18.33
Rigidity/Demand for Sameness	26	15/17/7/2	83.67	9.62
Sensitivity to Pain	19	8/7/2/1	43.86	21.05
Energy Level	20	8/9/2/1	48.57	22.50
Family Relationships	26	17/16/5/1	68.08	8.00
Loses Temper/Emotional Outbursts	31	22/20/4/1	63.15	16.67
Ability to Self-Regulate Emotions	32	23/18/4/2	72.95	11.29

Learning Outcomes
Intra/Interpersonal skills Outcomes
Sensory Outcomes
General Health Outcomes

Chart 3.

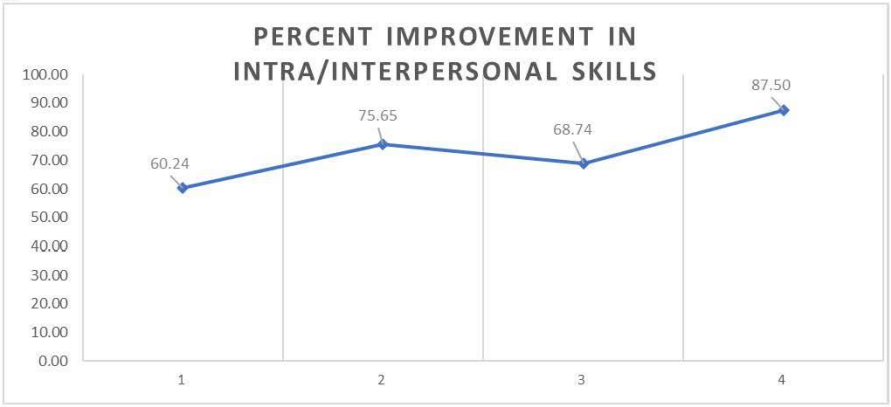


Chart 4.

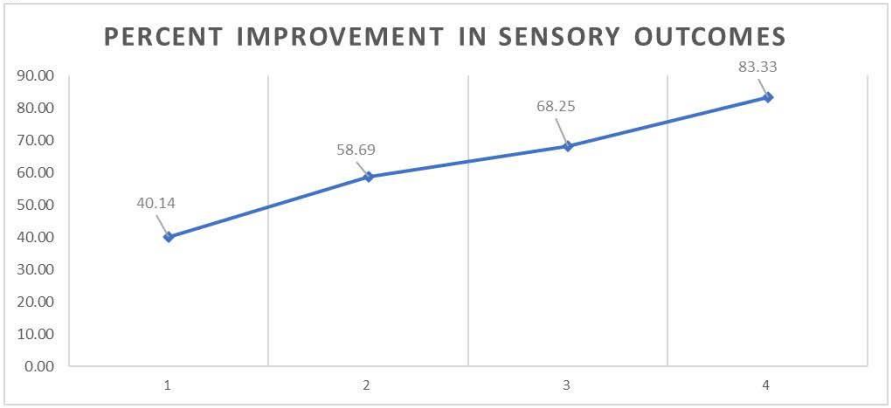
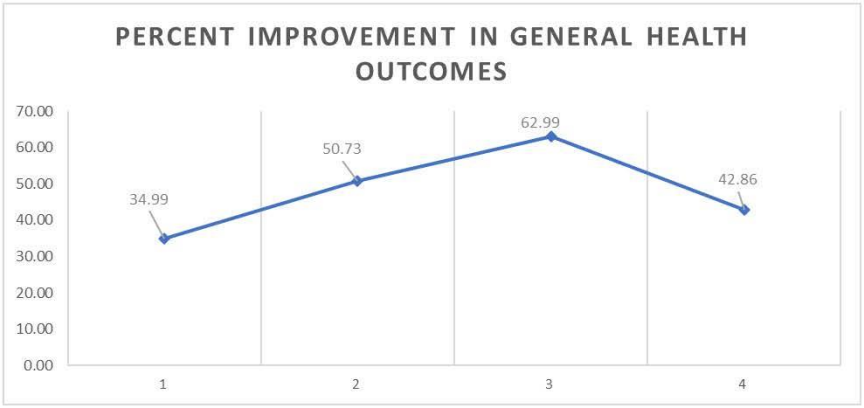


Chart 5.



Appendix

Chart 1.

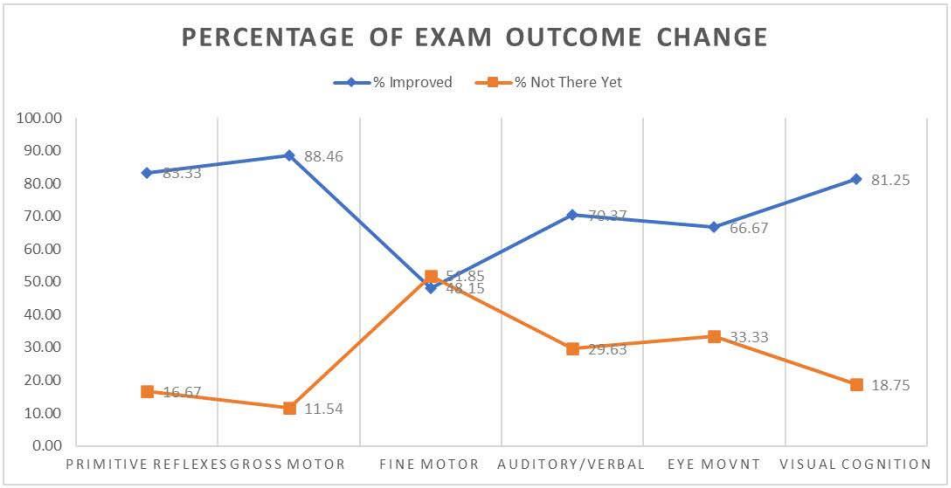
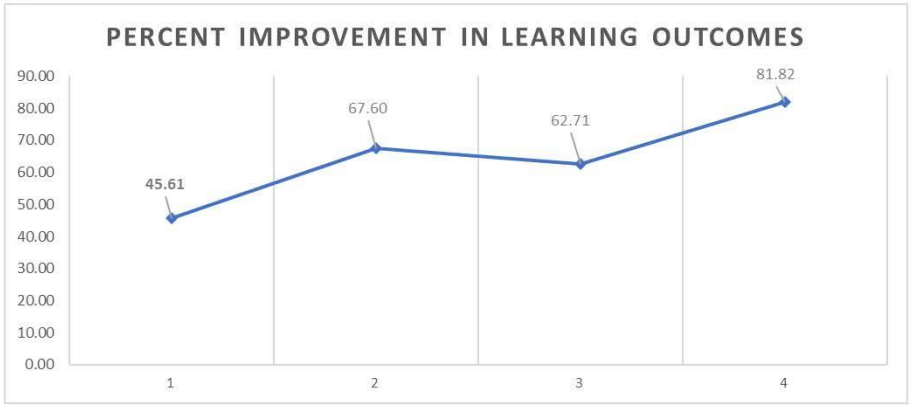
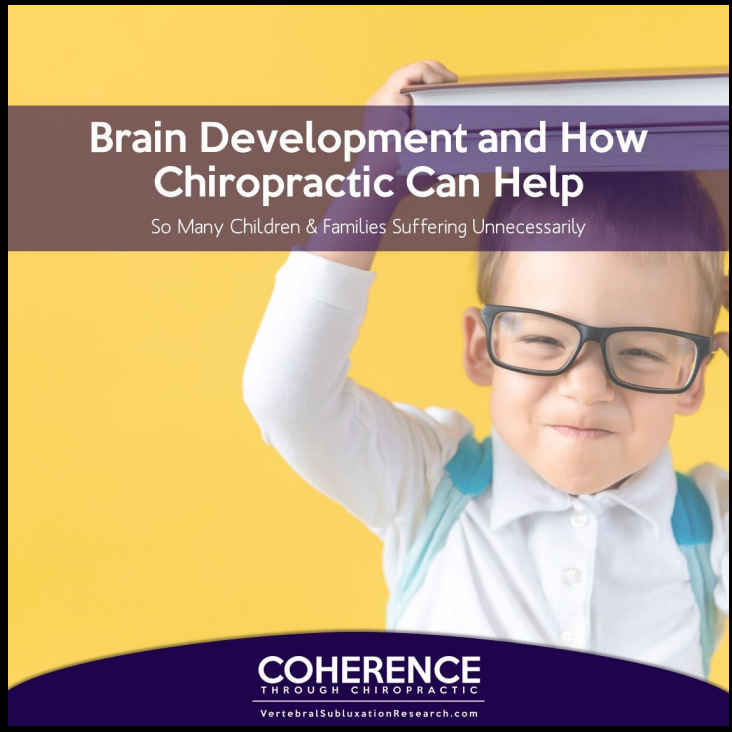


Chart 2.





Every Visit:
1. Static, muscle, motion palpation
2. Leg Checks

Initial and Re-exam visits:
3. Thermography
4. HRV
5. sEMG (Insight)
6. Posture/Gait assessment
7. ROM (active assessment)
8. Primitive reflex assessment - Moro, STNR, ATNR
9. Gross motor assessment - basic walk, heal to toe walk, cross body skip
10. Fine Motor assessment - Fine motor tasks using finger taps, grip style and control
11. Eye movement assessment - Fixation, convergence, divergence, tracking
12. Visual Cognitive assessment - two story questions are performed to assess processing and ability to create imagery, recall and retain imagery
13. Parent survey

VERTEBRALSUBLUXATIONRESEARCH.COM VOLUME 2019 | ISSUE 2

COHERENCE
THROUGH CHIROPRACTIC



Connections

CHIROPRACTIC, CONNECTIONS, CHILDREN, AUTISM, BIRTH TRAUMA

CASE STUDY

Improvement in Alpha Brain Waves, Coordination and Emotional Regulation in a Pediatric Patient with Chiropractic Care Using Network Spinal Analysis

Matthew Mancuso, DC[1] & Janet Cheng, DC[2]

Abstract

Objective: The objective of this report is to describe improvements in Alpha Brain Waves, coordination and emotional regulation experienced by a patient undergoing subluxation-based chiropractic care using Network Spinal Analysis.

Clinical Features: A 7-year-old female presented with slow physical skill acquisition and difficulty with coordination since birth. She had an aversion to using utensils, preferring to use her fingers to self-feed. She also had emotional outbursts and low self-esteem of two years duration.

Intervention & Outcomes: Management of this case is based on Reorganizational Healing (ROH) including chiropractic care through Network Spinal Analysis (NSA) for the reduction of facilitation within the spinal cord. The promotion of structural correction of the misalignment component of the associated vertebral subluxation and Somato Respiratory Integration (SRI) to connect enhanced somatic awareness with respiration were also goals of care. After two months there was improved Alpha Waves, coordination, spontaneous use of silverware for self-feeding and an improvement in emotional regulation.

Conclusion: Further research is warranted to examine the effect of chiropractic on brain waves and the development of coordination and emotional regulation in the pediatric population.

Key Words: *chiropractic, vertebral subluxation, adjustment, coordination, emotional regulation, Network Spinal Analysis (NSA), Alpha Brain Waves*

Introduction

Chiropractic is a health care discipline that serves to optimize health through the principle that the body has an innate intelligence by which it sustains and maintains itself. Chiropractors place particular emphasis on the subluxation, which compromises neural integrity and can cause deleterious effects to health.[1] In recent years, the association between the correction of vertebral subluxation and quality of health has been studied in greater detail with objective measures showing what chiropractors have long been reporting anecdotally.[2-3] Chiropractic care and the correction of vertebral subluxation have been associated with cases relating to improvements in quality of life,[4] structural integrity,[5] attention[6] and development of language,[7] among other aspects of health and wellness.[2-3]

The concept of subluxation is understood through various component models and categorizations of clinical applications as presented by Kent. Tonal approaches tend to view the spine and the nervous system as a functional unit with particular interest on functional outcomes, which are of value in subluxation-centered research.[8] Network Spinal Analysis is

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Original Research

Effects of Manual Approaches with Osteopathic Modality on Brain Correlates of Interoception: An fMRI Study

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Abstract

The present randomised placebo controlled trial explored the extent to which osteopathic manipulative treatment (OMT) affects brain activity, particularly the insula, during both an "interoceptive awareness" and "exteroceptive awareness" task in a sample of 32 right-handed adults with chronic Low Back Pain (CLBP) randomly assigned to either the OMT or sham group. Patients received 4 weekly sessions and fMRI was performed at enrolment (T0), immediately after the first session (T1) and at 1 month (T2). The results revealed that the OMT produced a distinct and specific reduction in BOLD response in specific brain areas related to interoception, i.e., bilateral insula, ACC, left striatum and rMFG. The observed trend across the three time points appears uncharacteristic. At T1, a marginal increase of the BOLD response was observed in all the above-mentioned areas except the rMFG, which showed a decrease in BOLD response. At T2, the response was the opposite: areas related to interoception (bilateral insula and ACC) as well as the rMFG and left striatum demonstrated significant decreased in BOLD response. The findings of this study provide an insight into the effects of manual therapies on brain activity and have implications for future research in the field.

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Introduction

The interaction between the sense of touch and the body is a well recognised process that takes place at different neural levels, with different effects and mechanisms of action. In the brain, the effect of this interaction produces different mental representations or experiences - also called feelings - of the body[1]. These include inputs from the physiological milieu of the body in terms of metabolic, structural and functional conditions at any given moment, a concept referred to as interoception[2]. Those feelings can be modulated by different stimuli and sources, including touch, ultimately modifying the perception of the internal and external world[3].

Several neurobiological studies posed that the insula (INS) is a critical hub for multimodal interoceptive integration, involved in interoceptive processes, such as awareness of sensations from the body[4], but also exteroceptive elements, such as perception of pain[5,6,] taste[7,8,9,10,] smell[11,] and touch[12]. In fact, external stimuli, i.e. pain, smell or taste, serve as body-mapped signals of the so-called peripersonal space [that is the space immediately surrounding the body][13,14]. Moreover, in the anterior insula exteroceptive and interoceptive information overlap with emotional domains[11], suggesting an underlying commonality[15]. In fact, the insula has been referred as a meeting point between external and internal milieus[16,17,18,19]. Detailed reviews of the interoceptive evidence are available elsewhere[2,3,20].

Methods to measure interoceptive differences comprise the use of questionnaires and behavioural tests that either exploit natural fluctuations in internal physiological signals or manipulate organ physiology experimentally[21,22]. For practical reasons, heartbeat detection tasks are measures largely utilised to assess differences among individuals regarding interoceptive accuracy and ability[23,24,25]. These tests quantify

Kwon Awarded Scholarship for Advanced Imaging Fellowship

Friday, July 13, 2018 - 11:39

FOUNDATION FOR VERTEBRAL SUBLUXATION



FVS Developing Advanced Imaging Research Agenda

Christie Kwon DC, MS was recently awarded a scholarship by the Foundation for Vertebral Subluxation (FVS) to participate in a Functional MRI Visiting Fellowship. The Fellowship took place earlier this year and has resulted in a flurry of activity and excitement at the FVS because of the potential this holds for subluxation research.

It's been known for almost 100 years that neural activity causes localized changes in blood flow and researchers have demonstrated that neural activity

An Advanced Imaging Research Agenda for the Evaluation of Vertebral Subluxation and Clinical Outcomes Related to its Management

Christie Kwon MS, DC, Matthew McCoy DC, MPH, Christopher Kent DC, JD

Background

The Foundation for Vertebral Subluxation (FVS), in its commitment to research pertaining to the vertebral subluxation, will engage a research agenda focused on means to detect and observe outcomes of subluxation-corrective care utilizing advanced imaging.

Chiropractors have long utilized plain film imaging as an objective means of analysis, and in recent times, some practitioners have incorporated the use of advanced imaging methods such as CT, MRI and fMRI. The scientific understanding of the nature of the vertebral subluxation suggests that there are effects to the central and peripheral nervous system and the physiology of the body. Functional MRI technology allows researchers to observe hemodynamic responses by imaging changes in blood flow which represent changes in neural activity. Task-oriented physiological responses, resting state neural connectivity, and flow of cerebrospinal fluid can also be measured utilizing functional MRI.[1-13]

Methods

Methodology related to the agenda will be project specific and initially will include formal training in the area of functional MRI (fMRI) and other advanced imaging for researcher(s) through the Foundation for Vertebral Subluxation.

Pilot and feasibility studies will also be designed and conducted including task-oriented imaging, pre-/post chiropractic care in healthy populations and the use of a Practice Based Research Network for multi-site studies.

Objectives include:

- To elucidate the nature of the vertebral subluxation, and its location, analysis, and correction via the chiropractic adjustment
- To explore the feasibility and usefulness of functional MRI, CT, cone beam CT, PET scanning and other imaging modalities in measuring components of vertebral subluxation and outcomes related to chiropractic care.
- To improve means of subluxation-correction outcomes assessment
- To observe outcomes in healthy populations under subluxation care
- To observe outcomes in special patient populations undergoing management of vertebral subluxation including:
    - Military veterans
    - Post Traumatic Stress Disorder
    - Traumatic Brain Injury
    - Neurodevelopmental Disorders
    - Neurodegenerative Disorders
    - Dysautonomia
    - Depression
    - Cardiac Sympathetic Disorders/Cardiac Coherence

Needs Assessment

1. Funding for fMRI scan time
2. Research time and resources
3. Determination of the variables to be measured
4. Development of study designs

Outcomes

This agenda is intended to inform:

1. Chiropractic practitioners
2. Chiropractic researchers
3. Other health care providers
4. Education
5. Policy and legislation

Conclusion

This agenda's work will serve as an opportunity for collaboration with institutions such as Emory University, Harvard University, and the Veterans' Administration. Outcomes of this research will influence patient management, quality and scope of legislation and policy related to utilization of advanced imaging modalities by the chiropractic profession.

CASE STUDY

Resolution of Essential Tremors in a Female Patient Undergoing Upper Cervical Chiropractic Care: A Case Report & Review of the Literature

Nathan Berner D.C.[1]

ABSTRACT

Objective: The objective of this case study is to present the chiropractic case management and improvement of a patient with diagnosed essential tremors and an upper cervical subluxation.

Clinical Features: A 58-year-old female presented to a private practice with a 40-year history of diagnosed essential tremors without relief. She additionally suffered from headaches, mid and low back pain, hip pain, sciatic pain, brain fog, difficulty concentrating and challenges with self-motivation.

Intervention and Outcomes: The patient was assessed for vertebral subluxation utilizing the Orthospinology analysis including a supine leg length check, hip calipers, cervical scanning palpation, and x-rays. Upon examination, a cervical vertebral subluxation complex was found. The patient was seen 12 times over 4 months of care and received 4 Orthospinology atlas adjustments. On post-adjustment X-rays, the atlas misalignment was reduced by all factors, and the patient's symptoms improved dramatically.

Conclusions: This case study demonstrated the upper cervical chiropractic management of a patient diagnosed with essential tremors. The patient found immediate relief of symptomatology and extended improvement in quality of life. This case highlights the need for more research on the link between upper cervical subluxation and essential tremors.

Key Words: *Chiropractic, vertebral subluxation, essential tremor, orthospinology, adjustment*

Introduction

Essential tremor (ET) is one of the most common movement disorders with a worldwide prevalence of 0.4% to 3.9% in the general population.[1] It is estimated to be 20 times more prevalent than Parkinson's. In the United States it is estimated that seven million individuals, and 1 in 25 adults over the age of 40 suffer from ET.[2]

The condition is usually progressive and normally mild but can also be debilitating, preventing many individuals from joining or continuing in the workforce. For such a common condition with potentially debilitating effects, one study found that public knowledge of its existence and characteristics was overall poor.[2]

Tremor is a rhythmic, mechanical oscillation of at least one body region. Essential tremor refers to a condition where there

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Case Study

Reduction of Essential Tremors in a 75-Year-Old Male Following Chiropractic Care: A Case Study & Review of the Literature

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1. *Private Practice of Chiropractic, Mobile, AL*
2. *Private Practice of Chiropractic, Columbus, MS*

Abstract

Objective: The objective of this case report is to discuss the positive health outcomes following chiropractic in a patient suffering from long standing essential tremors.

Clinical Features: A 75-year-old male presents for evaluation with a history of essential tremors that have progressively worsened within the last four years. Examination revealed vertebral subluxations in the cervical, thoracic and lumbar spine.

Intervention and Outcomes: The patient was examined for vertebral subluxation using radiographs, range of motion, and neurological and orthopedic testing according to Diversified and Thompson protocols. The patient was then adjusted 3 times per week for 4 weeks and further reassessed on the 12th visit for his response to his chiropractic schedule. At the reassessment the patient reported an improvement in his essential tremors.

Conclusion: Chiropractic care resulted in significant decrease of essential tremors for this patient. More research is recommended to explore the benefits of chiropractic in this population.

Key Words: *Essential Tremors, vertebral subluxation, Diversified, Thompson, Chiropractic, adjustment*

Introduction

Tremors are one of the most prevalent involuntary movement disorders and essential tremor is one of the most common. Tremors often affect various activities of daily living, such as eating and writing.[1,2] Approximately 5% of people over the age of 65 suffer from essential tremors.[3] Essential tremors effect the upper limbs in 95% of patients and are evident during action and positioning of the limbs, unlike the resting tremor associated with Parkinson's disease.[2,4]

Essential tremors are estimated to be misdiagnosed approximately 50% of the time.[5] Patients suffering from essential tremors are not considered functionally handicapped and their prognosis does not include a shortened life expectancy.[2] Alcohol is usually found to be a palliative factor although it has been reported that 39% of effected patients do not use alcohol for symptom control.[2,6]

The Movement Disorder Society defines tremors as involuntary, rhythmic, alternating, or oscillatory movements of interrelated muscle groups and are characterized by the frequency of oscillation and amplitude of movement.[4-6] Characteristics of essential tremors include coarse or fine movement that are typically slow and usually symmetric.[6] Essential tremors are postural and kinetic tremors in the absence of other neurological signs.[7]

Movement is controlled by integration of the corticospinal tracts, basal ganglia, and cerebellum and the neural dysfunction responsible for essential tremors is attributed to the inheritance of an autosomal dominant trait with variable pathological expression that are heterogeneous and degenerative.[2,6,8] Cognitive deficits, affecting attention and memory, are associated with regional cerebellar abnormalities.[3] The Essential Tremor Centralized Brain Repository, established in 2003, at Columbia University, is dedicated to the study of essential tremor and their associated impact on brain structure and function.[9]

The common abnormalities found include cerebellar degenerative changes and the presence of Lewy bodies on the brainstem.[9] The pathophysiology of essential tremors is not

CASE STUDY

Resolution of Intention Tremor Following Chiropractic in an Infant with Vertebral Subluxation: a Case Study and Selective Review of the Literature

Pamela Stone-McCoy, DC, CACCP[1] & Zoe C. Pogrelis, DC[2]

Abstract

Objective: To report on the positive health outcomes following the chiropractic management of a child with intention tremor and to review the related literature.

Clinical Features: A 20-month-old male child presented to a chiropractic office with intention tremor in his right upper extremity, wide gait, posterior and static posturing of arms, and speech articulation delay with signs of vertebral subluxations.

Interventions and Outcomes: Vertebral subluxations were addressed utilizing an Activator adjusting instrument. Indicators of vertebral subluxations were assessed using static and motion palpation findings. Cross-crawl at-home exercises were also advised as part of the care plan. Paraspinal thermal readings indicated a decrease in dysautonomia during reassessment. Frequency of intention tremor significantly decreased and parents reported a marked improvement in the patient's overall quality of life. Verbal communication skills also improved after two months of care.

Conclusion: This case reports on positive health outcomes following chiropractic in a child with intention tremor. Clinical research on chiropractic care for children with non-cerebral palsy cerebellar dysfunction is lacking, however, the proprioceptive pathway between the spine and the brain has been explored and mapped. This gap in research should be further investigated.

Key Words: *chiropractic, intention tremor, pediatric, cerebellar dysfunction, speech delay, vertebral subluxation, adjustment, gait.*

Introduction

Tremor is the most common movement disorder in the human population.[1] Kinetic tremor is a type of action tremor which is typically perceived while a limb is actually moving. If the movement is part of a goal-directed behavior, the tremor is termed an intention tremor; otherwise it is called a simple kinetic tremor.[2] Intention tremor is a condition in which the amplitude of tremor is seen to increase as the patient approaches a target with a limb. Intention tremor is due to cerebellar dysfunction and can be either unilateral or bilateral.[1]

Although there have been epidemiological surveys of adults with essential tremor and Parkinson's related tremor, there has yet to be an epidemiological survey targeted solely for children.[3] Intention tremor has not been investigated, independent of other tremor presentations. Intention tremor associated with essential tremor has been explored regarding the prevalence and association with essential tremor disease duration.[4]

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Case Study

Reduction of Essential Tremors in a 38 Year Old Male Undergoing Chiropractic Care for the Reduction of Vertebral Subluxation: A Case Report

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1. *Private Practice, Marietta, GA*
2. *Private Practice, Jupiter, FL*

Abstract

Objective: The objective of this case report is to detail improvement of a patient with essential tremors while undergoing chiropractic care.

Clinical Features: A 38 year old male who was diagnosed with essential tremors presented with complaints of uncontrollable bilateral arm and head tremors that started in 1997.

Intervention and Outcome: The patient was assessed for vertebral subluxations using instrumentation, radiographs, and video fluoroscopy following the Pierce Results System ™ of analysis. An adjustment was made using a toggle set, high-velocity, low-amplitude force on the site of subluxation. The patient reported a decrease in the severity of tremors immediately following the adjustment. After 21 visits during a span of over 5 months the patient reported an improvement of 99% for the head tremors, 75% for his arm tremors and 60% increase in quality of life.

Conclusion: The chiropractic care for a patient diagnosed with essential tremors is presented. Chiropractic care resulted in a dramatic decrease of symptoms and increase in quality of life for the patient. More research on the benefits of chiropractic care on people with essential tremors is needed.

Key Terms: *Essential Tremors, vertebral subluxation, Pierce Results System, video fluoroscopy*

Introduction

Essential tremor (ET) is the most the most common tremor disorder in the world. Previously known as benign tremors, essential tremors are estimated to occur in 3 to 4 people per 1000 with people over the age of 60 being at a higher risk.[1] The disease is as much as 20 times more prevalent than Parkinson's disease.[1] Although there is such a high prevalence, the medical system has limited means of controlling the problem. As of 2009 there was only 1 FDA approved drug for the problem.[2]

ET is characterized by postural and /or kinetic tremors in the frequency range of 4 to 12 Hz. The amplitude of the tremors usually decrease as time goes on while increasing in frequency. ET is considered to be a heterogeneous genetic condition.[2] It is estimated that ET is misdiagnosed up to 50% of the time.[3]

According to the Movement Disorder Society the following criteria are used for diagnosis of the condition. The inclusion criteria is bilateral postural tremor with or without kinetic tremor, involving hands and forearms, that is visible and persistent and a duration lasting over 5 years.

The exclusion criteria include: other abnormal neurological signs (except Froment's sign), presence of known causes of increased physiological tremor, concurrent or recent exposure to tremorogenic drugs or the presence of a drug withdrawal state, direct or indirect trauma to the nervous system within 3 months before the onset of tremor, historical or clinical evidence of psychogenic origins, convincing evidence of sudden onset or evidence of stepwise deterioration.[4]

Original Research

Improvement in Motor Function Measured by Grip Strength Following Chiropractic Adjustments to Reduce Vertebral Subluxation in 100 Subjects

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1. *Private Practice of Chiropractic, Singapore*

Abstract

Objective: To describe the improvement in motor function measured by grip strength in 100 patients following chiropractic care.

Methods: Motor function was measured by grip strength was recorded for 100 patients pre and post adjustment following Koren Specific Technique.

Results: Areas of vertebral subluxation were identified and adjusted using Koren Specific Technique. Results were statistically significant and demonstrated an increase in motor function as measured by grip strength post adjustment.

Conclusion: Chiropractic care deemed successful in improving motor function measured by grip strength for the patient population described. More research is warranted in this subject area to add to the current body of literature detailing the potential benefits of chiropractic care as it relates to motor function and grip strength.

Keywords: *Grip strength, motor function, quality of life, Koren Specific Technique, vertebral subluxation, adjustment*

Introduction

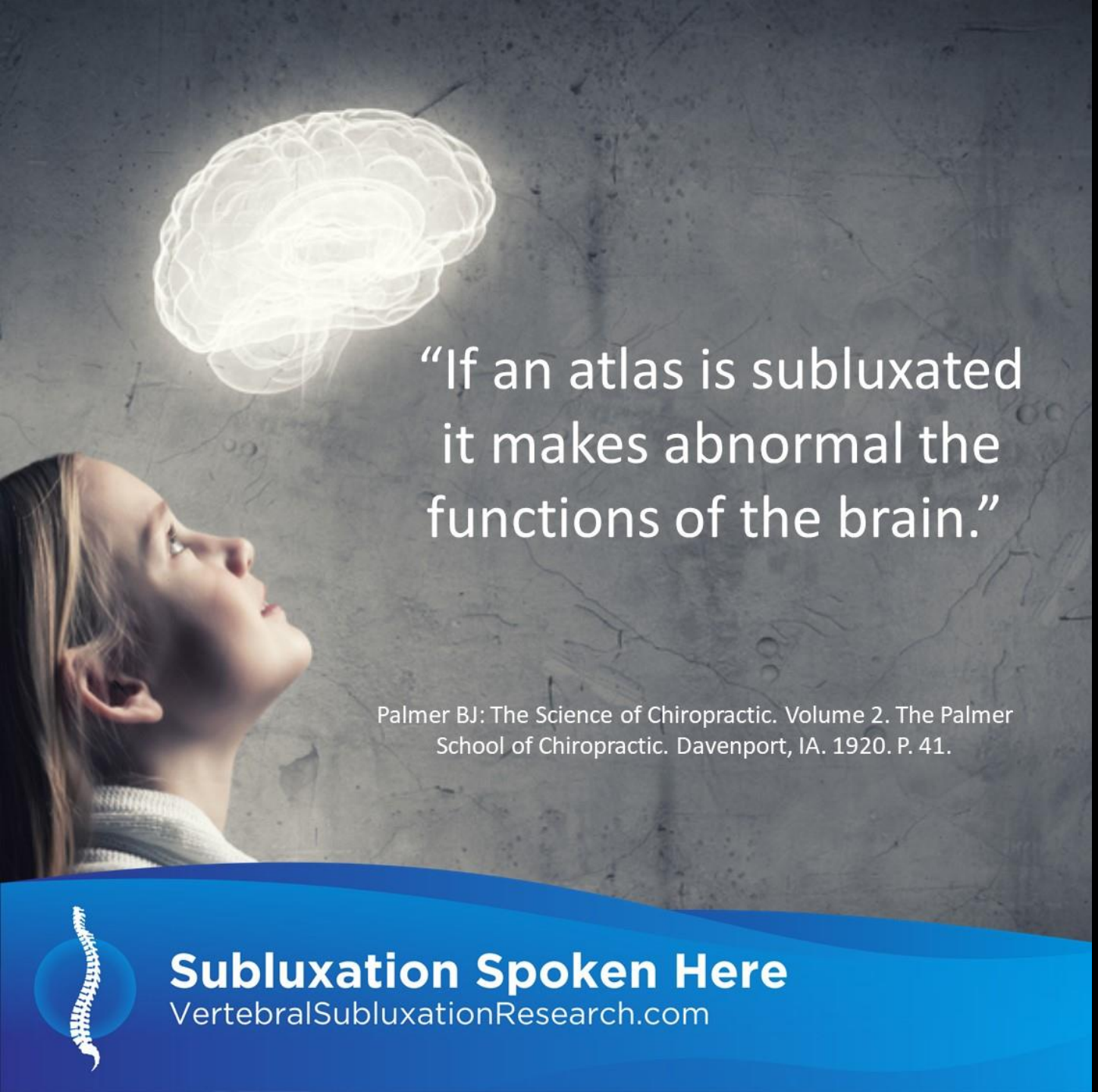
Most people who visit a chiropractor complain of some form of discomfort, very commonly in the neck and lower back. Chiropractic adjustments have long been known to be a popular choice in helping to alleviate these discomforts. To date, numerous studies have suggested that other than symptomatic relief, chiropractic care can improve muscular strength.

This paper was originally a case study of a 47-year-old female patient who was diagnosed with carpal tunnel syndrome by her specialist hand surgeon and was recommended to undergo a surgery. She had reported numbness and tingling in both thumbs and her second and third digits, and was medically diagnosed with moderately severe carpal tunnel syndrome in both hands via a motor conduction study ("MCS"). The electromyography (EMG) report showed absent median sensory potential from digit II bilaterally, prolonged median distal motor latency bilaterally and reduced compound muscle action potential over thenar muscles bilaterally.

By the fourth session of her chiropractic care, she had reported that the numbness was "almost gone." After undergoing 15 sessions of chiropractic treatment, she reported that her hands were completely free from numbness and she had regained strength in her hands. She was offered by the author to undergo the MCS for a reassessment but declined as she felt that the test was painful and traumatizing. However, she agreed to have her grip strength measured using a hand dynamometer as an alternative. (See Appendix 1)

On the 19th session, her grip strength was measured: Right hand measured 55.6lbs while her left hand measured 51.8lbs (both measured only post adjustment). Based on the "Physical Status According to the Test Result Given by the Dynamometer" (Appendix 2), her grip strength measured was considered normal for her age of 47 years old. (Note: Normal grip strength range for female in the age range of 45-49 years old is between 41.0 to 71.4lbs)

Reportedly, she regained sensory and motor functions of her hands. Experimentally, her grip strength on her 20th visit was remeasured before and after the chiropractic adjustment was rendered. The following results in Table 1 were obtained:



Other Brain "Stuff"

Case Study

Feeding Tube Removed Following Chiropractic in a Male Patient with Bickerstaff's Brainstem Encephalitis: A Case Study

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Brooke Terwilliger, DC[1]

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Abstract

Objective: To describe the positive health outcomes in a 31-year-old male following chiropractic care who was medically diagnosed with Bickerstaff Brainstem Encephalitis.

Clinical Features: A 31-year-old male patient presented to the chiropractic office with the medical diagnosis of Bickerstaff Brainstem Encephalitis, exhibiting the classical symptoms of confusion, ataxia and ophthalmoplegia, as well as dysphagia, dizziness, and depression. He had to use a feeding tube to eat.

Intervention and Outcomes: The patient was evaluated and adjusted using the Activator protocol. On the eighth adjustment the patient received manual cervical adjustment and after the 17th adjustment was switched to manual thoracic spine manipulations as well. After 12 adjustments, the patient no longer had dysphagia and his feeding tube was removed.

Conclusion: This case outlined a 31-year-old male who was diagnosed with Bickerstaff's Brainstem Encephalitis. Further research is encouraged in this population of patients.

Keywords: *Bickerstaff brainstem encephalitis, Anti GQ1b antibodies, Guillian-barre syndrome, ophthalmoplegia, Miller-fisher syndrome, Chiropractic, Subluxation, Adjustment*

Introduction

Bickerstaff brainstem encephalitis (BBE) is a rare, post-infectious disorder that causes confusion, ataxia and ophthalmoplegia.[1] With less than 100 cases reported, BBE is a very rare central and peripheral nervous system disorder similar to that of Guillain-Barre syndrome (GBS) and Miller Fisher syndrome.[2]

A common presentation observed in those that have been diagnosed with BBE can include: ophthalmoplegia, ataxia, drowsiness, brisk reflexes or extensor plantar responses.[3,4] The rarity of this disorder makes it a difficult topic to discover. In 1957, Bickerstaff added five cases to already existing study of patients presenting with similar symptoms.[2] In order to understand BBE we must look into Guillain-Barre Syndrome further because of their overlapping similarities and the rarity of the disease.

Guillain-Barre Syndrome is the most common attained inflammatory neuropathy. Etiology remains unclear but pathophysiology includes demyelination of spinal nerve roots.[5] Guillian-Barre Syndrome affects motor pathways more often than sensory and is usually quite symmetrical. In about two thirds of patients, the syndrome begins five days to three weeks after a trivial infectious disorder, surgery, or vaccination.

Weakness accompanied by paresthesia commonly begins in the distal legs bilaterally and progresses superiorly to the arms, but it can seldom start in the upper body; arms or head. In 90% of patients with Guillain-Barre Syndrome, weakness is

CASE STUDY

Improvement Following Chiropractic Care in an 11-year-old Male with Traumatic Brain Injury: Case Report & Review of Literature

Megan Karls DC[1], Kory Pugh DC[2], Stephen Wooten DC, ICCSP, CCSP[3], Rod Floyd DC[4] & Joel Alcantara DC[5]

Abstract

Objective: To describe the chiropractic care of a child with difficulties in upper and lower extremity motor control.

Clinical Features: An 11-yr-old male presented for chiropractic care with a history of traumatic brain injury (TBI) as a result of a motor vehicle collision 5 years prior. The patient lacked proper motor control and use of his left hand and lacked balance and co-ordination of the lower extremities. The patient had difficulties with speech and was unable to find balance on a global wobble board and took 5 minutes to find balance on a uniplanar wobble board and held it for 5 seconds.

Intervention and Outcome: The patient received chiropractic adjustments characterized as high velocity, low amplitude (HVLA) thrust type known as Diversified and Thompson Technique. In addition to adjustments, neuromuscular re-education was utilized to provide increased coordination for left upper extremities and proprioception for lower extremities. The patient received care over a period of 8 months consisting of 28 visits. As a result of the care he received, the patient demonstrated improved coordination, is able to balance on the global wobble board, is better able to enunciate words and has an improved quality of life.

Conclusion: This case report provides supporting evidence on the effectiveness of chiropractic care in children with traumatic brain injury.

Key words: *Traumatic brain injury, subluxation, spinal adjustment, chiropractic, balance, speech*

Introduction

In a study to characterize the prevalence, effectiveness, cost-effectiveness and describe caregiver or patient-related variables associated with the use of CAM, Soo et al.[1] found that the use of CAM was common among pediatric neurology patients with over half of the families reporting benefits with CAM, and few side effects. Galicia-Connolly et al.[2] found similarly with chiropractic as the most common practitioner-based CAM therapy in use along with massage, faith healing, aromatherapy, homeopathy, and relaxation. Furthermore, the investigators found that many patients used CAM products at the same time as conventional medicine.

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4. Professor, Palmer College of Chiropractic- Florida, Port Orange, FL, USA (Deceased)
5. Research Director, the International Chiropractic Pediatric Association, Media, PA, USA and Senior Research Consultant, Sherman College of Chiropractic, Spartanburg, SC, USA

CASE STUDY

The Role of Chiropractic in Traumatic Brain Injury: A Case Study

Andrea B. Ryan, D.C.[1]

ABSTRACT

Objective: To demonstrate the importance of chiropractic care as an integral part of the healing process of a patient with a Traumatic Brain Injury (TBI).

Clinical Features: A 55 year old female patient presented to the office with a history of two automobile accidents which had both caused a number of physical symptoms including whiplash, loss of range of motion in her right arm, SI joint pain, shoulder pain, hand pain, parasthesias in the upper and lower extremities, and loss of balance. Complicating the healing process was the onset of depression and suicide attempt after the death of her husband, six years after the second automobile accident.

Interventions and Outcomes: Torque Release Technique protocols were used to evaluate and adjust spinal subluxations as it provides a low force adjustment. Adjustments were performed twice weekly over the documented seven months of care. Within one month of care, the patient noted a decrease in symptoms and an improvement in her quality of life. Periodic re-evaluations demonstrated an improvement in physical findings as well as improvement in the function of her autonomic and motor systems as documented by thermal and SEMG scanning.

Conclusion: The results of this case study indicate that patients with traumatic brain injury may benefit from including chiropractic care while healing from their physical and emotional stresses.

Key Words: *Chiropractic, Subluxation, Torque Release Technique, Traumatic Brain Injury, Surface Electromyography, Thermography,*

Introduction

Traumatic Brain Injuries (TBI) have the ability to drastically alter a person's lifestyle both temporarily and/or permanently for the rest of their life. There are physical, biochemical, and emotional stresses that are associated with a TBI. As one of the aims of chiropractic care is to reduce those stresses and find a balance in a person's life, it is a vital component to the healing process of any patient inflicted with a TBI. Care must be taken to evaluate the neurological integrity and spinal stability of the patient and tailoring the technique to be utilized to what the patient can tolerate.

The purpose of this case study was to document the healing process of a patient with a TBI and to demonstrate the role that chiropractic played in this process. Prior to beginning care, the chiropractor and patient discussed the goals for the patient with those goals being subluxation reduction, symptom reduction, and increased quality of life. Over a documented seven months of care, the doctor and patient observed success in all three areas as demonstrated by physical exam findings, results of surface electromyography thermal scanning and patient subjective reports.

Case Report

History

A 55-year-old female patient presented to the author's office with significant neurological and neuromuscular symptoms due to a severe brain injury. The patient had a history of two car accidents within two years. The first was a head on collision, and the second, one year later, involved a half-ton truck accelerating into her parked car.

Immediately after the first car accident, the patient experienced a loss of range of motion in the right arm, severe

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Hypothesis

Lymphatic Drainage of the Brain: Implications for Chiropractic

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Abstract

Recent neurophysiological research has elucidated the means by which the glymphatic system may deliver interstitial solutes and metabolic waste products from deep brain tissues to the body's lymphatic and venous circulation for clearance. The implications of these new neurophysiological discoveries to the field of chiropractic care are discussed with respect to current knowledge of the impact of upper cervical subluxation on intracranial fluid dynamics.

Key words: *chiropractic, glymphatics, lymphatics, subluxation*

Introduction

"You don't know what you don't know, or what you don't know you don't know." Modern allopathic medicine is based upon the premise that we know enough to "control" or "fix" the human body, while in reality, we truly are in constant exploratory states of understanding the complicated machines in which we live. What happens when a basic premise of "what we know" is overturned?

Recently, researchers at the University of Virginia offered evidence that overturned the long-held assumption that the brain lacks a direct connection to the lymphatic system. In their 2015 Nature publication "Structural and Functional Features of Central Nervous System Lymphatic Vessels", Antoine Louveau and colleagues presented evidence of functional, lymphocyte-containing lymphatic vessels lining the dural sinuses of mice, which drain into the deep cervical lymph nodes.[1]

These lymphatic channels appear to link the also recently characterized glymphatic system,[2] which conducts cerebrospinal fluid through deep brain tissue and removes cellular waste products, to the body's venous circulation. The CNS lymphatic vessel system represents a previously unknown conduit for clearance of waste products from deep within the brain, as well as for immune surveillance.

This is a groundbreaking finding, because for so many years scientists maintained that the brain was isolated from the lymphatic and/or immune system. Louveau's new discovery may serve to reminds us that even after centuries of studying the body, fresh knowledge continues to come forth that both supports chiropractic ideas and causes us to re-write anatomy textbooks.

The identification of a new lymphatic drainage system changes our understanding of how the brain clears out metabolic waste products, and also opens new doors for our understanding of neurodegenerative diseases. Evidence has demonstrated persistent reduced venous outflow through internal jugular veins after mild traumatic brain injury,[3] suggesting the possibility of a long-term connection between decreased fluid clearance from the brain and the early-onset neurodegenerative diseases often found in athletes such as football players or boxers.

Similarly, Zivadinov and Chung showed that jugular venous reflux (JVR) may also cause cerebral venous drainage impairment which could result in pathology.[4] Compromise of outflow via the internal jugular vein has also been studied by Mandolesi and colleagues[5] and others[6] with respect to potential connection to the pathogenesis of multiple sclerosis.

The types of impedence of internal jugular outflow described above may be important in light of Louveau's new model of lymphatic clearance from deep brain tissue, since flow of CSF within the CNS is dependent on a pressure gradient, the low side of which is venous pressure in the superior sagittal sinus.[7] Decreased outflow from the internal jugular vein may therefore result in incremental increases in intracranial CSF pressure and decreased flow, and thereby by extention result in increased congestion of fluids, metabolites, and lymphocytes as they move through the adjacent dural sinus lymphatic vessels, simply by generation of back pressure. It is of note that lymphatics within the enclosed cranial cavity would by definition be more susceptible to incremental pressure increases within the cavity, and therefore any degree of lymphatic obstruction within the enclosed cranial cavity would result in impaired waste clearance from brain tissues.

CASE STUDY

Complications Following Brain Surgery Improved After Upper Cervical Chiropractic Care: A Case Study

Justin Brown, DC[1], Jonathan Chung, DC[1], Kyle O'Connell, DC[2]

ABSTRACT

Objective: To evaluate and discuss the effects of upper cervical chiropractic care on a 17-year-old female patient with a loss of balance, speech difficulties and postural distortion following the removal of an astrocytoma from her cerebellum

Clinical Features: The patient is a 17-year-old female that was diagnosed with a cerebellar astrocytoma that was previously removed. The patient presented to the office with significant postural abnormalities, difficulty with balance and difficulty with speech. that began post surgery. The patient presented to the office 4 years after the surgery.

Intervention & Outcomes: A case history and chiropractic examination was performed and it was determined that the patient had a subluxation of the C1 (atlas) vertebra. The patient received chiropractic care following the National Upper Cervical Chiropractic Association (NUCCA) protocol. The duration of care was five months and the patient was seen 28 times. At each visit she was checked for vertebral subluxation and was adjusted a total of 26 times. The patient reported an improvement in her balance from a 6/10 to a 9/10 and experienced a 90% improvement in her speech.

Conclusion: The findings presented in this case suggest that upper cervical adjustments may benefit patients who suffer from post surgical complications.

Key Words: *chiropractic, NUCCA, balance, proprioception, ataxia, cerebellum, subluxation, astrocytoma, cancer*

Introduction

The cerebellum is part of the central nervous system (CNS) that is a relatively large mass posterior to the pons and medulla. It consists of two lateral hemispheres that are connected by a narrow middle part called the vermis.[1] The cerebellum has no direct ability to cause muscle contraction but if harmed or removed, body movements become uncoordinated and abnormal.

This happens because the cerebellum helps to sequence motor activity and makes adjustments in the body's motor patterns. The cerebellum makes changes to movement patterns as they are happening so the body will conform to the signals directed by the cerebral cortex and other parts of the brain.[2] The connection between the motor units of the body to the CNS is also seen in muscle spindles as they enable the CNS to modify or control the activity of the receptors.[3]

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ORIGINAL RESEARCH

Eighty-One Patients with Multiple Sclerosis and Parkinson's Disease Undergoing Upper Cervical Chiropractic Care to Correct Vertebral Subluxation: A Retrospective Analysis

Erin L. Elster, D.C.

ABSTRACT

Objective: The objective of this article is threefold: to examine the role of head and neck trauma as a contributing factor to the onset of Multiple Sclerosis (MS) and Parkinson's disease (PD); to explore the diagnosis and treatment of trauma-induced injury to the upper cervical spine through the use of protocol developed by the International Upper Cervical Chiropractic Association (IUCCA); and to investigate the potential for improving and arresting MS and PD through the correction of trauma-induced upper cervical injury. Data from 81 MS and PD patients who recalled prior trauma, presented with upper cervical injuries, and received care according to the above protocol are reviewed.

Clinical Features: Each patient was examined and cared for in the author's private practice in an uncontrolled, non-randomized environment over a five-year period. Of the 81 MS and PD patients, 78 recalled that they had experienced at least one head or neck trauma prior to the onset of the disease. In order of frequency, patients reported that they were involved in auto accidents (39 patients); sporting accidents, such as skiing, horseback riding, cycling, and football (29 patients); or falls on icy sidewalks or down stairs (16 patients). The duration between the traumatic event and disease onset varied from two months to 30 years.

Intervention and Outcome: Two diagnostic tests, paraspinal digital infrared imaging and laser-aligned radiography, were performed according to IUCCA protocol. These tests objectively identify trauma-induced upper cervical subluxations (misalignment of the upper cervical spine from the neural canal) and resulting neuropathophysiology. Upper cervical subluxations were found in all 81 cases. After administering treatment to correct their upper cervical injuries, 40 of 44 (91%) MS cases and 34 of 37 (92%) PD cases showed symptomatic improvement and no further disease progression during the care period.

Conclusion: A causal link between trauma-induced upper cervical injury and disease onset for both MS and PD appears to exist. Correcting the injury to the upper cervical spine through the use of IUCCA protocol may arrest and reverse the progression of both MS and PD. Further study in a controlled, experimental environment with a larger sample size is recommended.

Key Indexing Terms: *upper cervical spine, chiropractic, Parkinson's disease, Multiple Sclerosis, trauma*

Introduction

While the link between head trauma and the later development of Parkinson's disease (PD) or Multiple Sclerosis (MS) remains controversial, many PD and MS researchers have confirmed the connection.[1-12] Several researchers have reported a strong association between head trauma and the subsequent study, performed at the Mayo Clinic and headed by Dr. J.H. Bower, investigated the association between head trauma and PD in more detail.[1] By reviewing the complete medical records of both cases and controls, the study team was able to objectively determine prior occurrence of head trauma without introducing recall bias. Study results suggest that head trauma is

Seizures



Seizures

- Significant Motor Development and Quality of Life Improvement in a Rare Seizure Condition (MMPSI) Following Vertebral Subluxation Reduction: A Case Study. Journal of Pediatric, Maternal & Family Health Chiropractic, Volume 2022

- Resolution of Psychogenic Non-epileptic Seizures Following Chiropractic Care: A Case Study & Review of the Literature. Journal of Upper Cervical Chiropractic Research, Volume 2019

- Resolution of Chronic Seizures in an Infant Undergoing Chiropractic Care for Vertebral Subluxation: A Case Report and Review of the Literature. Journal of Pediatric, Maternal & Family Health Chiropractic, Volume 2018
-
- Reduction of Seizures & Self Aggression Following Chiropractic Care to Reduce Upper Cervical Subluxation in a 3-Year-Old Male: A Case Study & Review of the Literature. Journal of Upper Cervical Chiropractic Research, Volume 2018

- Reduction of Seizures in a Toddler with Lissencephaly Undergoing Chiropractic Care: A Case Study & Review of the Literature. Journal of Pediatric, Maternal & Family Health Chiropractic, Volume 2017

- Resolution of Recurrent Pseudoseizures in a 14-Year-Old Female Using Torque Release Technique: A Case Study. Annals of Vertebral Subluxation Research, Volume 2014

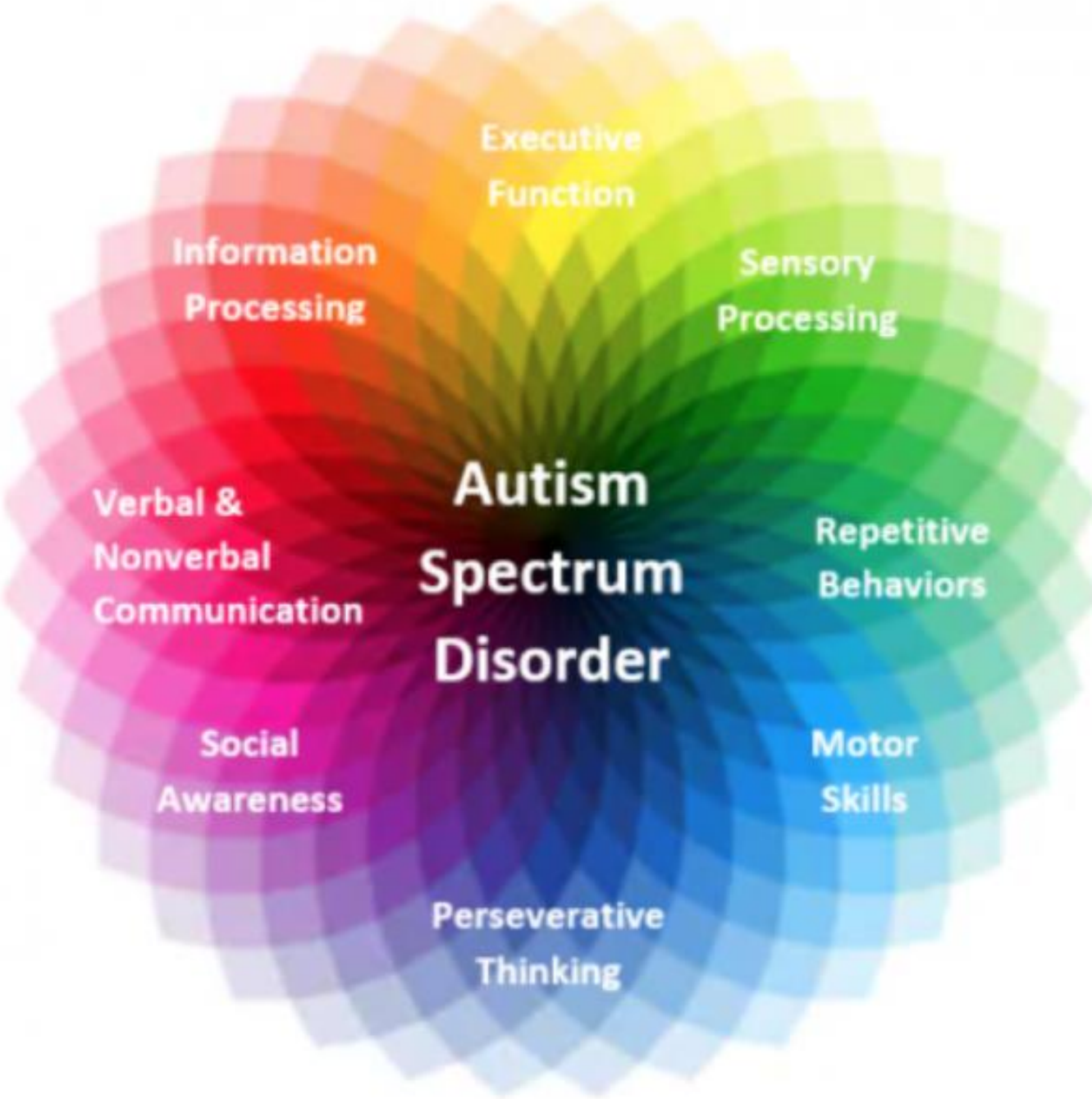
- Resolution of Chronic Epileptic Seizures & Improved Cervical Curve Following Chiropractic Care: A Case Report. Annals of Vertebral Subluxation Research, Volume 2016

Seizures

- Resolution of Seizures in a 20-year-old Male Following Chiropractic Care to Reduce Vertebral Subluxation: A Case Study & Review of the Literature. Annals of Vertebral Subluxation Research
- Resolution of Seizures & Improvement in Quality of Life in a 22-Year-Old Female with Epilepsy Following Upper Cervical Chiropractic Care. Journal of Upper Cervical Chiropractic Research, Volume 2017
- Reduction of Seizures in a Four-Year-Old Male with Intractable Frontal Lobe Epilepsy Following Upper Cervical Chiropractic Care: A Case Study. Journal of Pediatric, Maternal & Family Health Chiropractic, Volume 2017
- Cessation of Seizures, Behavioral Disturbances and Improvement in Cognitive Developmental Delay Following Upper Cervical Chiropractic Care in a 2 Year Old: A Case Report. Journal of Upper Cervical Chiropractic Research, Volume 2015
- An Epidemiological Approach to the Effects Subluxation-Based Chiropractic Care had in Managing a Three Year Old Girl with Autism, Acid Reflux, Bilateral Head Pain, Seizures, and Vomiting: A Case Study and Review of the Literature. Annals of Vertebral Subluxation Research, Volume 2013

Seizures

- Seizure, Ataxia, Fatigue, Strabismus and Migraine Resolved by Precise Realignment of the First Cervical Vertebra: A Case Report. Journal of Upper Cervical Chiropractic Research, Volume 2012
- Resolution of Post-Concussion Seizures Following Atlas Orthogonal Technique. Journal of Upper Cervical Chiropractic Research, Volume 2011
- Resolution of Post-traumatic Epilepsy, Headaches & Dizziness Following Upper Cervical Chiropractic Care in a 19-Year-Old Male: Case Study & Review of the Literature. Journal of Upper Cervical Chiropractic Research, Volume 2019
- Sandifer Syndrome: Improved Health Outcomes in an Infant Undergoing Care for Vertebral Subluxation. Journal of Pediatric, Maternal & Family Health Chiropractic, Volume 2016


Executive Function
Information Processing
Sensory Processing
Autism Spectrum Disorder
Verbal & Nonverbal Communication
Repetitive Behaviors
Social Awareness
Motor Skills
Perseverative Thinking

Autism/Subluxation Models

- Bipedalism - abnormalities in postural development or activity may disrupt cerebellar and cortical maturation.
- Cognition & motor functions tied. Motor incoordination & disruptions in executive functions are a common thread in developmental disorders. Due to inability to bind motor and cognitive functions, resulting from understimulation of the cerebellum and thalamus
- Dysfunction of hemisphericity whereby there is a failure to achieve equal activity between the left and right hemispheres.

Autism/Subluxation Models

- ***Brain Reward Cascade***: In vertebrates, the vertebral motor units are intimately related with the *Brain Reward Cascade* by virtue of the nocioceptive reflex from vertebral joints to the limbic system where the cascade takes place.

- ***Kinematic Imbalance due to Suboccipital Strain*** (KISS Syndrome). Biedermann. Upper cervical dysfunctions causing: torticollis, microsomy, scoliosis, motor asymmetries, and slowed motor development.

- ***Blocked Atlantal Nerve Syndrome.*** Gutmann. Central motor impairment and development. Causation lay in the neurophysiological connections between the upper cervical spine and the brainstem

Autism/Subluxation Models

- **Cerebral Metabolic Changes**
- **Cerebrospinal Fluid Flow Alterations**
- **Blood Flow Alterations**

Adaptability

Biological pathways to adaptability – interactions between genome, epigenome, nervous system and environment for adaptive behavior.

C. Wolf and D. E. J. Linden

Genes, Brain and Behavior (2012) 11: 3–28

Estudo dos potenciais evocados auditivos em autismo*****

Study of auditory evoked potentials in autism

Fernanda Cristina Leite Magliaro*
Claudia Inês Scheuer**
Francisco Baptista Assumpção Júnior***
Carla Gentile Matas****

Abstract
Background: electrophysiological assessment of hearing in au
findings obtained in the electrophysiological assessments of
these to the results obtained for individuals of the same age
16 individuals with autism (study group) and 25 normal indiv
eight to 20 years underwent anamnesis, pure tone audiomet
measures, brainstem auditory evoked potential (BAEP), m
potential (P300). Results: the study group presented a
showing statistically significant differences when co
of alterations found in the study group the follow
brainstem alteration in the BAEP, both (electro
and absence of response in the P300. In the
between the groups were found only fo BAEP regard
interpeaks I-III and I-V. Conclusion: autistic individuals pr
impairment in the brainstem auditory pathway and corticals
Key Words: Auditory Evoked Potentials; Audiometry; Autistic Disorder; Pervasive Child Development Disorders.

Resumo
Tema: avaliação eletrofisiológica da audição em indivíduos com autismo. Objetivo: caracterizar os achados das avaliações eletrofisiológicas da audição em indivíduos com autismo, bem como comparar seus resultados aos obtidos em indivíduos com desenvolvimento típico da mesma faixa etária. Método: foram realizadas anamnese, audiometria tonal, logoaudiometria, medidas de imitância acústica, potenciais evocados auditivos de tronco encefálico (PEATE) e de média latência (PEAML), e potencial cognitivo (P300), em 16 indivíduos com autismo (grupo pesquisa) e 25 normais (grupo controle), com idades entre oito e 20 anos. Resultados: o grupo pesquisa apresentou resultados alterados em todos os potenciais evocados auditivos, havendo diferença estatisticamente significante quando comparado ao grupo controle. Foi observada uma maior ocorrência de alteração do tipo tronco encefálico baixo no PEATE, do tipo Ambas no PEAML, e ausência de resposta no P300, para o grupo pesquisa. Na análise dos dados quantitativos, verificou-se que apenas para o PEATE ocorreu diferença estatisticamente significante entre os grupos, com relação às latências das ondas III e V e interpicos I-III e I-V. Conclusão: indivíduos com autismo apresentam alterações no PEATE e P300, sugerindo comprometimento da via auditiva em tronco encefálico, áreas subcorticais e corticais.
Palavras-Chave: Potenciais Evocados Auditivos; Audiometria; Transtorno Autístico; Transtornos Globais do Desenvolvimento Infantil.

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*****Trabalho Realizado no Laboratório de Investigação Fonoaudiológica em Potenciais Evocados Auditivos do Departamento de Fisioterapia, Fonoaudiologia e Terapia Ocupacional da FMUSP.

"Autistic individuals present altered BAEP and P300, suggesting impairment in the brainstem auditory pathway and cortical/subcortical area."

Hindawi
Autism Research and Treatment
Volume 2018, Article ID 5093016, 8 pages
https://doi.org/10.1155/2018/5093016

Research Article

A Study of the Correlation between VEP and Clinical Severity in Children with Autism Spectrum Disorder

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Visual evoked potential (VEP) is a technique used to assess the brain's ele e to visual stimuli. T
were to examine neural transmission within the visual pathway throu sting in preschool children w
disorder (ASD) and compare it to age-matched controls, as well ch for a correlation between the VEP parameters and the
symptoms of ASD. Participants were composed of ASD childre 9 males) and typically developing children (8 males and 4 females),
aged between 3 and 5 years. Checkerboards were chosen as the pattern-reversal VEP. The clinical severity of ASD was assessed using
the Autism Treatment Evaluation Checklist (ATEC) and the Vineland Adaptive Behavior Scales 2nd edition (VABS-II). Our findings
demonstrated that children with ASD had significantly longer N145 latency compared to the controls. A longer N145 latency corre-
lated with a higher score of ATEC within the sensory/cognitive awareness subdomain. In addition, a slower N145 response was also
associated with a lower VABS-II score within the socialization domain. The correlation between longer VEP latency and abnormal
behaviors in children with ASD suggests a delayed neural communication within other neural circuits, apart from the visual path-
way. These lines of evidence support the possibility of using VEP, along with clinical parameters, for the assessment of ASD severity.

"Using VEP as the index of neural processing within the visual system of children with ASD could become a possible tool for the clinical assessment of the disease severity."

1. Introduction

Autism is a common neurodevelopmental disorder characterized by impaired communication, deficits in social skills, and abnormal behaviors. The current version of the Diagnostic and Statistical Manual of Mental Disorders (DSM) by the American Psychiatric Association (APA), the DSM-5, collapses various diseases within the group of pervasive developmental disorders (PDD), including autism disorder, into a single disorder, the autism spectrum disorder (ASD) [1]. The diagnosis of ASD is strongly dependent on clinical assessment via a medical interview with the parents or a

The well-accepted pathogenesis of autism is the abnormality in neural communication [2]. Impaired long-distance brain connectivity is also commonly observed in a number of autism researches [3–5]. An evaluation of brain connectivity is usually performed by a magnetic resonance imaging (MRI) based technique called diffusion tensor imaging (DTI). However, this neuroimaging technique requires an experienced neuroradiologist to perform and to interpret the results, demanding much time for data analysis, and is relatively quite expensive. In addition, DTI also requires subjects to limit their movements. It is, therefore, a rather difficult technique to perform on children with autism. Moreover, evidence from

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PLOS ONE

Investigating the Autonomic Nervous System Response to Anxiety in Children with Autism Spectrum Disorders

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Abstract

Assessment of anxiety symptoms in autism spectrum disorders (ASD) is a challenging task due to the symptom overlap between the two conditions as well as the difficulties in communication and awareness of emotions in ASD. This motivates the development of a physiological marker of anxiety in ASD that is independent of language and does not require observation of overt behaviour. In this study, we investigated the feasibility of using indicators of autonomic nervous system (ANS) activity for this purpose. Specially, the objectives of the study were to 1) examine whether
causes significant measurable changes in indicators of ANS in an ASD population, and 2) characterize the pa
changes in ASD. We measured three physiological indicators of the autonomic nervous system respons
electrodermal activity, and skin temperature) during a baseline (movie watching) and anxiety condition (S
a sample of typically developing children (n = 17) and children with ASD (n = 12). The anxiety condition
changes in heart rate and electrodermal activity in both gro
between the two groups. In particular, the ASD group showed ele
conditions. Elevated and blunted phasic electrodermal activity were found in
conditions, respectively. Finally, the ASD group did not show the typical decrease
anxiety. These results suggest that 1) signals of the autonomic nervous system may be used
children with ASD, and 2) ASD may be associated with an atypical autonomic response to anxiety that
with sympathetic over-arousal and parasympathetic under-arousal.

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"These results suggest that 1) signals of the autonomic nervous system may be used as indicators of anxiety in children with ASD, and 2) ASD may be associated with an atypical autonomic response to anxiety that is most consistent with sympathetic over-arousal and parasympathetic under-arousal.'"

Introduction

Autism spectrum disorders (ASDs) are a group of neuro-developmental disorders that are characterized by a triad of features: impairments in communication, deficits in social interactions, and presence of restrictive repetitive and stereotypical behaviours, interests, or activities. In addition to difficulties in these three core domains, ASDs are also associated with various co-morbidities, including psychiatric disorders. Among these, anxiety is one of the most pressing clinical concerns due to its negative impact on physical and emotional well-being [1,2], high prevalence in this population [3], and its bidirectional relationship with the core deficits of ASD. Anxiety concerns in ASD present across all levels of functioning [4] and persist over the life span [4].

Anxiety symptoms are closely linked to the core deficits of ASD. On the one hand, core-deficits of ASD may contribute to anxiety. On the other hand, anxiety may drive and/or exacerbate core-deficits in ASD. For example, social anxiety may lead to further avoidance of social situations, promoting isolation from social groups [3]. In fact, anxiety has been correlated with greater degrees of loneliness and social disability [7], decreased participation in school and community [2], and negative externalizing behaviours such as aggression and self-injury [3,8,9]. Moreover, repetitive behaviors seen in ASD, such as hand flapping, rocking, and echolalia, may be anxiety coping mechanisms [6].

Because of the close relationship between ASD and anxiety, assessment of anxiety symptoms in children with ASD is a challenging task. Such assessment relies on self-reports or observation of overt behaviour. Self-reports are often not reliable in ASD because of deficits in communication as well as difficulties with emotional awareness and introspection [10]. Behavioural symptoms of anxiety are also difficult to recognize in ASD due to

frontiers in Neuroscience

REVIEW
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doi: 10.3389/fnins.2017.00627

Connectopathy in Autism Spectrum Disorders: A Review of Evidence from Visual Evoked Potentials and Diffusion Magnetic Resonance Imaging

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Individuals with autism spectrum disorder (ASD) show superior processing fine details; however, they often exhibit impairments of ge motion perception, and visual attention as well as core social deficits. Inc has suggested that social deficits in ASD arise from abnormal function connectivities between and within distributed cortical networks that ar social information processing. Because the human visual system a set of parallel, hierarchical, multistage network systems, w altered connectivity of visual networks contributes to so ASD. In the present review, we focused on studies of a attention networks in ASD using visual evoked potenti (ERPs), and diffusion tensor imaging (DTI). A s , ERP, conducted in our laboratory have demonstra x alterations enhancement) of visual and attention netw D. Recent data have suggested that the atypical visual perception observed D is caused by altered connectivity within parallel visual pathways and attenti networks, thereby contributing to the impaired social communication observed in ASD. Therefore, we conclude that the underlying pathophysiological mechanism of ASD constitutes a "connectopathy."

Keywords: autism spectrum disorder, connectopathy, visual perception, attention, visual evoked potentials, event-related potentials, diffusion tensor imaging, magnetic resonance imaging

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INTRODUCTION

Autism spectrum disorder (ASD) is a neurodevelopmental condition that is characterized by alterations in social communication and interaction; it co-occurs with restricted, repetitive patterns of behavior, interests, or activities (American Psychiatric Association, 2013). Recent neuroimaging studies have suggested that ASD is a disconnection syndrome that is associated with connectivity alterations between distributed brain areas recruited during social information processing, rather

"Therefore, we conclude that the altered connectivity of visual processing networks may contribute to impaired social communication exhibited in ASD. The underlying pathophysiological mechanism of ASD can be considered a '**connectopathy**'"

Hindawi Publishing Corporation
Neurology Research International
Volume 2015, Article ID 794829, 20 pages
http://dx.doi.org/10.1155/2015/794829

Hindawi

Review Article

The Role of the Craniocervical Junction in Craniospinal Hydrodynamics and Neurodegenerative Conditions

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The craniocervical junction (CCJ) is a potential choke point for craniospinal hydr
contributory role in the pathogenesis and progression of neurodegenerative diseases such as Alzheimer's disease, Parkinson's disease, MS, and ALS, as well as many other neurological conditions including hydrocephalus, idiopathic intracranial hypertension, migraines, seizures, silent-strokes, affective disorders, schizophrenia, and psychosis. The purpose of this paper is to provide an overview of the critical role of the CCJ in craniospinal hydrodynamics and to stimulate further research that may lead to new approaches for the prevention and treatment of the above neurodegenerative and neurological conditions.

"The craniocervical junction is a potential choke point for craniospinal hydrodynamics . . ."

1. Introduction

The CCJ comprises the base of the skull, atlas (C1), and axis (C2), as well as muscles and connective tissues that connect the skull to the cervical spine. It further includes the dura mater and dentate ligament attachments of the brain and cord to the foramen magnum and upper cervical spine [1–8]. Moreover, the CCJ links the vascular and cerebrospinal fluid (CSF) systems in the cranial vault to those in the spinal canal. Craniospinal hydrodynamics refer to the relationship

blood into the brain and cord during systole causing a spike in intracranial pressure (ICP). To prevent damage to the brain from excess pulsatility pressure, the increase in volume must be matched by a simultaneous increase in drainage of venous blood and CSF from the cranial vault. In addition to the internal jugular veins humans developed an accessory drainage system comprising emissary veins that link the dural sinuses to the vertebral venous plexus and serve as the primary drainage routes of the brain during upright posture

Regional Cerebral Blood Flow

"The decrease in rCBF in ASD is a global event, which involves the bilateral frontal, temporal, limbic system and basal ganglias"

Chin Med J (Engl). 2011 May;124(9):1362-6.

Regional cerebral blood flow in children with autism spectrum disorders: a quantitative ^{99}mTc-ECD brain SPECT study with statistical parametric mapping evaluation.

Yang WH1, Jing J, Xiu LJ, Cheng MH, Wang X, Bao P, Wang QX.

Laura Stiles, Editor

December 17, 2015

Evidence of Unstable Blood Flow in Autistic Brains

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Researchers found increased levels of the proteins nestin and CD34 in autistic brains, molecular markers of angiogenesis.

A team of scientists has found evidence that people with autism have unstable vessels in the brain which prevents the proper delivery of blood flow, according to research published in the *Journal of Autism and Developmental Disorders*.

"In a typical brain, blood vessels are stable, thereby ensuring a stable distribution of blood," said Patricia Whitaker-Azmitia, PhD, professor in the Department of Psychology and director of the Graduate Program in Integrative Neurosciences at Stony Brook University, N.Y., in a statement. "Whereas in the autism brain, the cellular structure of blood vessels continually fluctuates, which results in circulation that is fluctuating and, ultimately, neurologically limiting."

For their study, the researchers examined human postmortem brain tissue both from normal brains and from brains with a **diagnosis of autism**. During microscopic analysis, the researchers were blind to whether the tissue came from a normal or autistic brain.

In the autistic brain tissue, the researchers found the presence of angiogenesis, the creation of new blood vessels. They did not find this in the normal brain tissue.

Fluctuating Cellular Structure

“In the autism brain, the cellular structure of blood vessels continually fluctuates, which results in circulation that is fluctuating and, ultimately, neurologically limiting.”

Theory of Mind

"The perfusion abnormalities seem to be related to the cognitive dysfunction observed in autism, such as deficits in ToM, abnormal responses to sensory stimuli, and the obsessive desire for sameness"

Brain. 2000 Sep;123 (Pt 9):1838-44.
Abnormal regional cerebral blood flow in childhood autism.
Ohnishi T1, Matsuda H, Hashimoto T, Kunihiro T, Nishikawa M, Uema T, Sasaki M.

Theory of Mind

The ability to understand other people's thoughts and emotions

doi:10.1093/brain/awt166 Brain 2013: 136; 2825–2835 | 2825

BRAIN
A JOURNAL OF NEUROLOGY

Early brain enlargement and elevated extra-axial fluid in infants who develop autism spectrum disorder

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Prospective studies of infants at risk for autism spectrum disorder have provided important clues about the early behavioural symptoms of autism spectrum disorder. Diagnosis of autism spectrum disorder, however, is not currently made until at least 18 months of age. There is substantially less research on potential brain-based differences in the period between 6 and 12 months of age. Our objective in the current study was to use magnetic resonance imaging to identify any consistently observable brain anomalies in 6–9 month old infants who would later develop autism spectrum disorder. We conducted a prospective infant sibling study with longitudinal magnetic resonance imaging scans at three time points (6–9, 12–15, and 18–24 months of age), in conjunction with intensive behavioural assessments. Fifty-five infants (33 'high-risk' infants having an older sibling with autism spectrum disorder and 22 'low-risk' infants having no relatives with autism spectrum disorder) were imaged at 6–9 months; 43 of these (27 high-risk and 16 low-risk) were imaged at 12–15 months; and 42 (26 high-risk and 16 low-risk) were imaged again at 18–24 months. Infants were classified as meeting criteria for autism spectrum disorder, other developmental delays, or typical development at 24 months or later (mean age at outcome: 32.5 months). Compared with the other two groups, infants who developed autism spectrum disorder ($n = 10$) had significantly greater extra-axial fluid at 6–9 months, which persisted and remained elevated at 12–15 and 18–24 months. Extra-axial fluid is characterized by excessive cerebrospinal fluid in the subarachnoid space, particularly over the frontal lobes. The amount of extra-axial fluid detected as early as 6 months was predictive of more severe autism spectrum disorder symptoms at the time of outcome. Infants who developed autism spectrum disorder also had significantly larger total cerebral volumes at both 12–15 and 18–24 months of age. This is the first magnetic resonance imaging study to prospectively evaluate brain growth trajectories from infancy in children who develop autism spectrum disorder. The presence of excessive extra-axial fluid detected as early as 6 months and the lack of resolution by 24 months is a hitherto unreported brain anomaly in infants who later develop autism spectrum disorder. This is also the first magnetic resonance imaging evidence of brain enlargement in autism before age 2. These findings raise the potential for the use

CSF

This study confirms and extends previous findings that increased extra-axial CSF is detectable at 6 months in high-risk infants who develop ASD.

Increased Extra-axial Cerebrospinal Fluid in High-Risk Infants Who Later Develop Autism
Shen, Mark D.Piven, J. et al.
Biological Psychiatry , Volume 82 , Issue 3 , 186 - 193



Autism

Integrative Review of the Literature – January 2019

Neurodevelopmental Disorders and Chiropractic: A Systematic Review of the Literature

Jeffrey Holuszko BS, DC[1], Phillip Falardeau BS, DC[2], Cameron Banks, BS, DC[3], Hailey Coonrad BS, DC[4], Jerome Lubbe BA, DC[5], Kenichi Oumi BA, DC[6], Joseph Ritola BA, DC[7], Jill Smith BS, DC[8], Nicole Tukdarian BA, DC[9]

Abstract

Objective: To provide a comprehensive analysis of the current body of scientific literature regarding the chiropractic management of a wide variety of neurodevelopmental disorders.

Methods: A literature search was performed using PubMed, MANTIS, the Index to Chiropractic Literature, McCoy Press, Galileo, and ScienceDirect. Inclusion criteria consisted of full-text peer-reviewed articles written in English as they related to the efficacy of chiropractic management of neurodevelopmental disorders.

Results: 51 articles were selected. The results were: Three Randomized Controlled Trials (RCT), 7 Reviews of Literature, three Case Series, 34 Case Studies and three Survey/Commentaries.

Conclusion: There is a definite need for RCTs and subsequent systematic reviews of RCTs. Of research obtained in this study, the majority of articles dealt specifically with Autism Spectrum Disorder (ASD) and attention deficit disorder (ADD)/Attention Deficit Hyperactivity Disorder (ADHD) and were predominantly case studies. The chiropractic community should see this as a call to action to provide more substantive research regarding neurodevelopmental disorders.

Key Terms: *Chiropractic, subluxation, pervasive developmental disorders (PDD), ADD, ADHD, learning disorders, sensory processing disorders, developmental delays, developmental, Epilepsy, Autism Spectrum Disorders, ASD, Bipolar*

Introduction

Definition

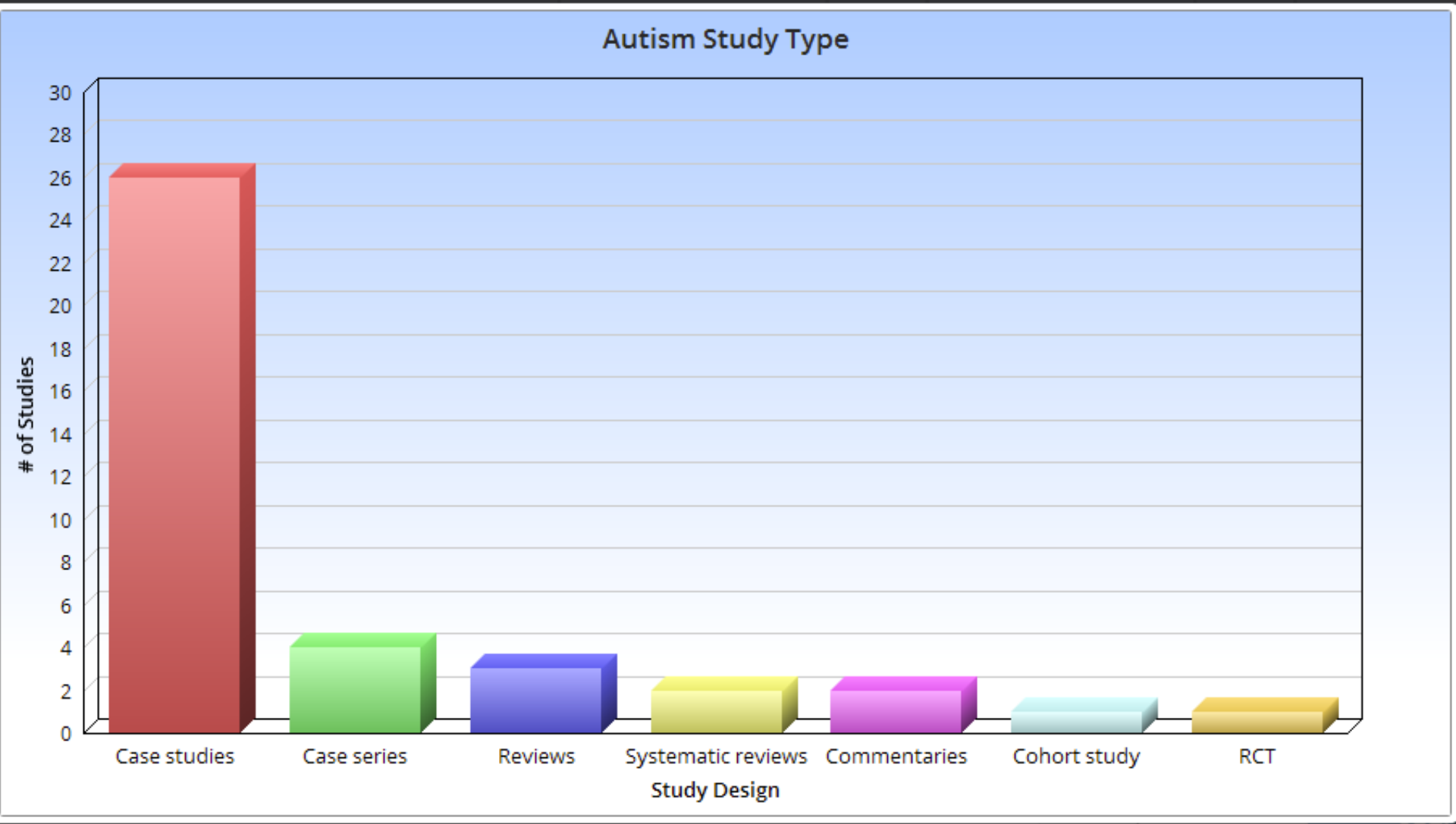
Neurodevelopmental disorders are disabilities associated primarily with the functioning of the neurological system and brain. According to *Pediatric Chiropractic*[1] these include but are not limited to Attention Deficit Disorder (ADD), Attention Deficit Hyperactivity Disorder (ADHD), learning disorders, sensory processing disorders, developmental delays, Cerebral Palsy (CP), mental retardation, epilepsy & seizure, Autism Spectrum Disorders (ASD) and Bipolar Disorder (BD). Possible etiologies for neurodevelopmental disorders involve environmental, biological and/or genetic factors.

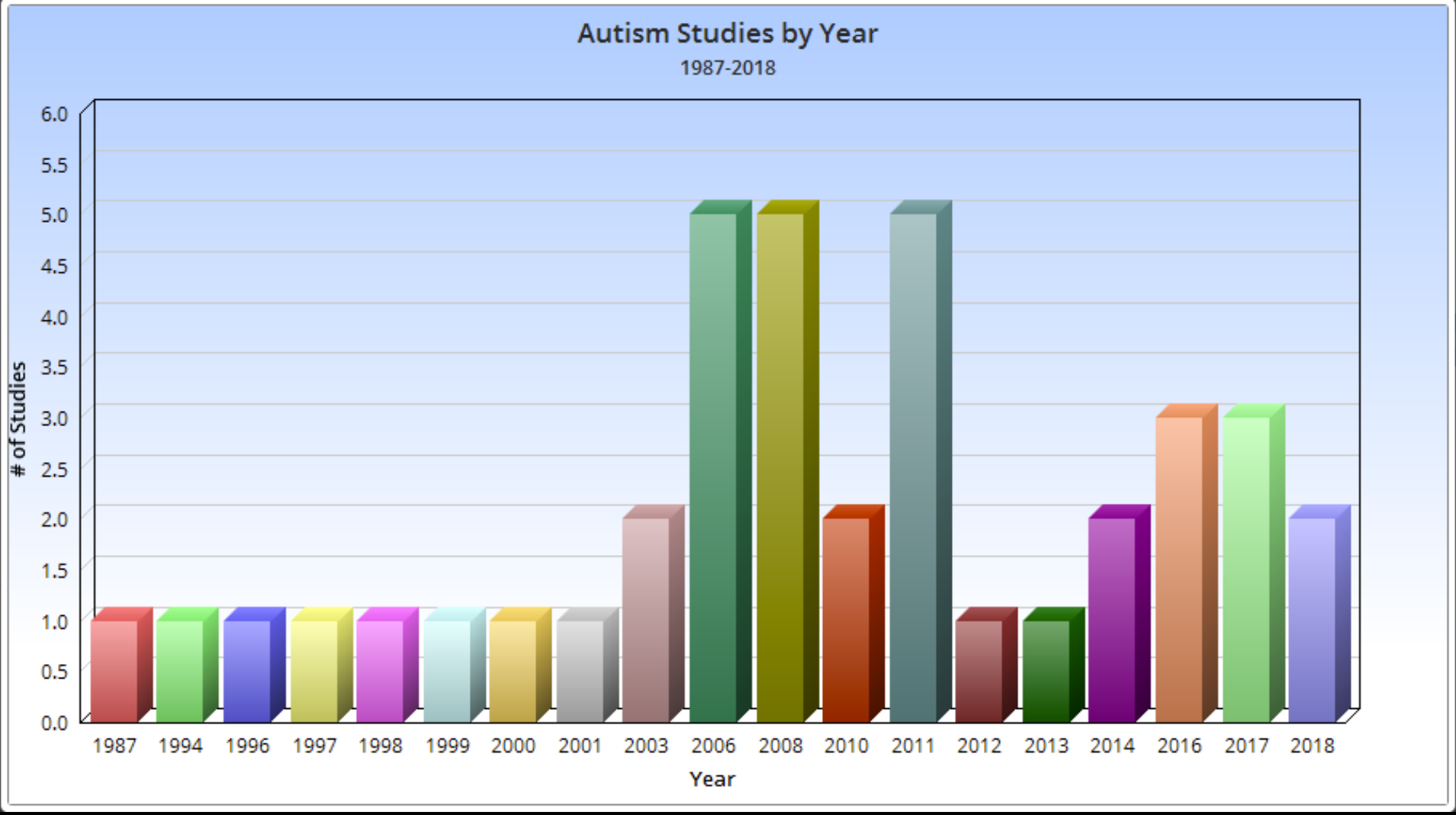
It is important to note the etiology of neurodevelopmental disorders is not the focus of this review. Rather, we focus on the systematic review of literature and efficacy of chiropractic care for the treatment of neurodevelopmental disorders after manifestation and or proper medical diagnosis in children and young adults.

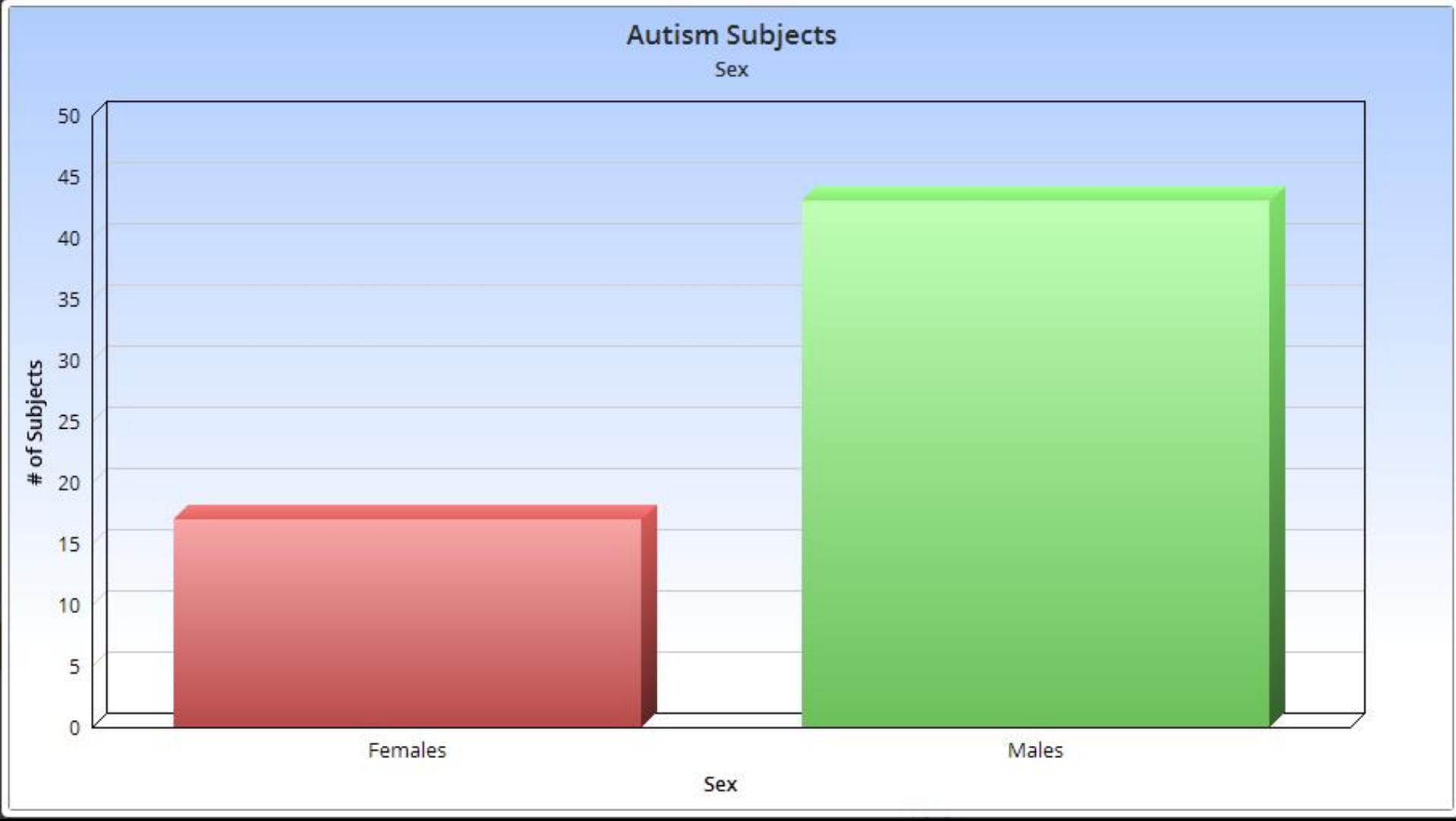
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7. Private Practice of Chiropractic, San Cruz, CA
8. Private Practice of Chiropractic, Sarasota, FL
9. Private Practice of Chiropractic, Smyrna, GA

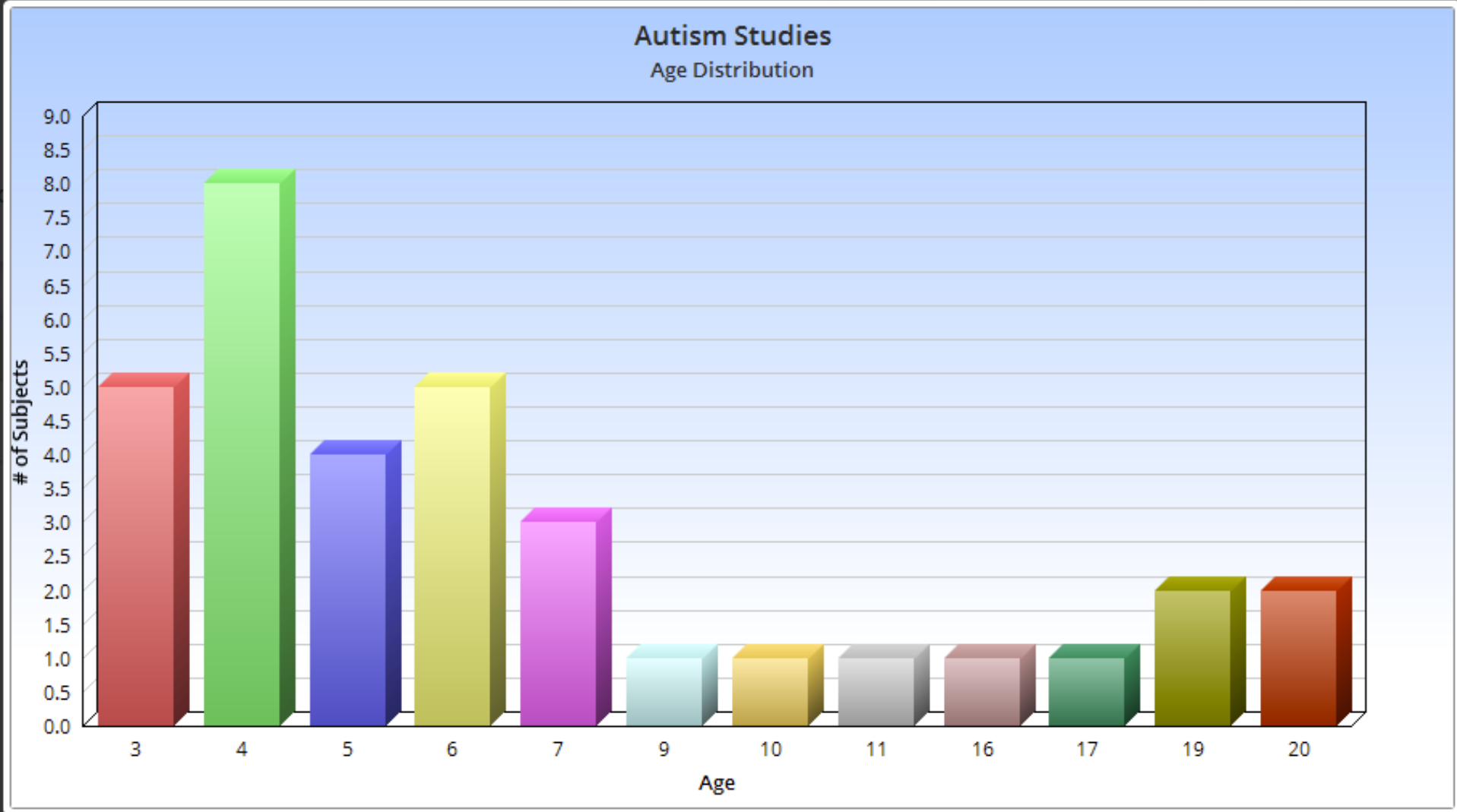
Summary

Total Number of Studies	39
Total Number of Subjects	66
Case Studies	26
Case Series	4
Reviews	3
Systematic Reviews	2
Commentaries	2
Cohort	1
RCT	1


Autism Study Type
# of Studies
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
Case studies
Case series
Reviews
Systematic reviews
Commentaries
Cohort study
RCT
Study Design


Autism Studies by Year
1987-2018
# of Studies
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1987
1994
1996
1997
1998
1999
2000
2001
2003
2006
2008
2010
2011
2012
2013
2014
2016
2017
2018
Year


Autism Subjects
Sex
50
45
40
35
30
25
20
15
10
5
0
# of Subjects
Females
Males
Sex


Autism Studies
Age Distribution
# of Subjects
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
3
4
5
6
7
9
10
11
16
17
19
20
Age

Data Analysis

Age Range: 3-20 years

Average Age = 8 years

Sex: 17 females & 43 Males

 # Visits: Range = 1-56 visits

Techniques Used

Activator
Cranial
Craniosacral
Diversified
Drop
Functional neurology
Grostic
Knee chest
Logan
NSA
NUCCA
SOT
Thompson
Trigger points
TRT
Upper Cervical
Webster toggle

Vaccination History

Incomplete

Medication History

Incomplete

Chiropractic Care and Behavior in Autistic Children

ANDREW L. AGUILAR, B.S., D.C., M.B.A.,
JOHN D. GROSTIC, D.C.
BRUCE PFLEGER, PH.D., M.S.

ABSTRACT

Autism is a severe behavioral and neurological disorder including gross deficits in language development. If speech is present, peculiar speech patterns such as immediate and delayed echolalia, metaphorical language, or pronominal reversal frequently will exist. A child with autism may display bizarre responses to various aspects of the environment including resistance to change, peculiar interest in or attachments to animate or inanimate objects.

A systematic series of chiropractic adjustments were administered to 26 autistic children to see if behavioral or neurological remediations would occur concomitant to the nine month care plan. The children were recruited through three local autism societies from the greater Atlanta area.

Behavioral data for the study were collected by both the classroom teachers and the children's parent(s). Objective data were collected through Brain Stem Evoked Potential (BSEPs) recordings, pre and post x-ray films, a dual probe infrared heat recording graph instrument, and a supine leg check analysis. Student clinicians performed physicals on each child reevaluating at three month intervals. Subjective data were collected through both a Modified Autism Checklist[1] and a Childhood Autism Rating Scale (CARS).[2]

Key words: autism, pervasive developmental disorder, developmental delayed, subluxation, upper cervical technique, Grostic technique, orthospinology

INTRODUCTION

In this multiple case study, adjustments were given in an attempt to remove neurological interference by correcting atlas cervical subluxations in autistic children and observe any behavior/motor skills changes. Orthospinology upper cervical chiropractic technique was used primarily due to Dr. John D. Grostic's *Dentate Ligament—Cord Distortion Hypothesis*, where he states that, "abnormal movement of a cervical vertebra (is) capable of transmitting pathologic forces to the spinal cord and brainstem."[3,4] Removal of this neurological interference was hypothesized to allow for the child to lead a more "normal" lifestyle at home and in his school environment. Several population studies previously completed lend support with this hypothesis.[5,6,7]

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John D. Grostic, D.C., Bruce Pfleger, PH.D, M.S. *Sid E. Williams Research Center, Life University School of Chiropractic, Marietta, Georgia.*

AUTISM[8] CHARACTERISTICS

1. Onset before 30 months of age.
2. Pervasive lack of responsiveness to other people (autism).
3. Gross deficits in language development.
4. If speech is present, peculiar speech patterns such as immediate and delayed echolalia, metaphorical language, pronominal reversal (use of the pronoun "you" when "I" is the intended meaning).
5. Bizarre responses to various aspects of the environment, e.g., resistance to change, peculiar interest in or attachments to animate or inanimate objects.
6. Absence of delusions, hallucinations, loosening of associations, and incoherence as in schizophrenia.

FEATURES

In early autistic childhood there is invariably failure to develop cooperative play and friendships; but, as the children grow older, greater awareness of and attachment to parents and other familiar adults often develop. Some of the least handicapped may eventually reach a stage where

2000 - Aguilar

ORIGINAL RESEARCH

Clinical Efficacy of Upper Cervical Versus Full Spine Chiropractic Care on Children with Autism: A Randomized Clinical Trial

Khaled A. Khorshid, DC, MS, MBBCh[†], *Roy W. Sweat, DC*[††]
David A. Zemba, Jr., DC, Brett N. Zemba, DC[†††]

ABSTRACT

Background: Children with autism are presented with multiple categories of clinical pictures that affect their social, sensory, speech, and physical development. Parents of autistic children seek all possible therapies available including chiropractic. In this study, the clinical outcome of an upper cervical based chiropractic technique is compared to full spine adjustment in autistic children.

Methods: The clinical effects of full spine adjustment for 14 autistic children were evaluated using the Autism Treatment Evaluation Checklist (ATEC). ATEC is a questionnaire about children's development and progress answered by parents. It was developed and is scored, online, by the Autism Research Institute of San Diego, CA. Seven of these children were randomly assigned to be shifted to Atlas Orthogonal upper cervical adjustment. The remaining seven children continued full spine adjustment. Repeated monthly clinical assessments were done for 3-5 months. Pre and post x-ray and leg length analysis was also monitored.

Results: The clinical improvement of the autistic children showed in the parent's observations through decrease of ATEC scores. This improvement of ATEC scores was seen in the cases of six of the seven children under upper cervical adjustment and in six of the seven children under full spine adjustment. The total ATEC average improvement in the upper cervical group was 32%, while only 19% in the full spine group. Two autistic children under the upper cervical adjustment protocol no longer met the criteria to be considered autistic following the interventions.

Conclusion: In this study, the clinical outcome of chiropractic care showed higher efficacy with upper cervical adjustment when compared to full spine adjustment in autistic children. Further studies are recommended.

Key words: *Autism, chiropractic pediatrics, chiropractic adjustment, chiropractic technique, autistic children, atlas orthogonal, vertebral subluxation, full spine.*

Introduction:

Since the primary problem in autistic children is neurological, it is prudent to research the efficacy of chiropractic care in these children. Functional MRI in patients with autism showed significant differences from normal people in the activity of cerebellar mesolimbic and temporal lobe cortical regions of the brain when processing facial expressions. [1] These differences are most likely neurodevelopmental in origin. There are several different approaches for treatment of autistic children beyond the scope of this paper [2]; some of these will be mentioned later. Diagnosis of this condition is based upon parent's observations of specific behaviors, and an experienced team of clinicians. This team may include a neurologist, psychologist, pediatrician, speech/language therapist, learning consultant, and other professionals who are knowledgeable about autism.

Autistic children usually show an admixture of bizarre behaviors, developmental delay, and developmental deviance.[3] The disorder used to manifest before thirty months of age and was occasionally referred to as infantile autism. Now, there is an increase of autism with increasing incidence in all children of all ages and throughout the world. The deviance of developmental and social behavior in these children are shown in features such as:

(a) Failure to make eye contact, use facial expressions and body postures and gestures to regulate social interaction
(b) Rarely seeking others for comfort and affection
(c) Rarely initiating interactive play with others
(d) Rarely offering comfort to others or responding to others' distress or happiness
(e) Rarely greeting others

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Khorshid – 2006

RCT

REVIEW ARTICLE

A Systematic Review of the Literature on the Chiropractic Care of Patients with Autism Spectrum Disorder

Joel Alcantara, DC,[1,2,3,#] Joey D. Alcantara, DC,[4] and Junjoe Alcantara, DC[3]

Background: In addition to impacting the affected child and his/her family's quality of life, recent estimates place the lifetime cost for an individual with ASD at $3.2 million and $35 billion for the entire birth cohort. Given the clinical heterogeneity of ASD, treatment approaches are multidisciplinary including alternative therapies, particularly when no pharmaceutical agent is effective for the core symptoms of ASD. Chiropractic is a popular alternative therapy for children. A systematic review of the literature was performed to provide context for future research endeavors in this field.

Methods: A systematic review of the literature on the chiropractic care of patients with ASD utilized 8 databases. Eligibility criteria for inclusion included: (1) the study was a primary investigation/report published in an English peer-reviewed journal; (2) the study involved patients ≤18 years; and (3) patients are diagnosed with autism, Asperger's Syndrome, PDD-NOS, or ASD.

Results: Our systematic review of the literature revealed a total of five articles consisting of three case reports, one cohort study and one randomized comparison trial. The literature is lacking on documenting the chiropractic care of children with ASD.

Discussion: At the heart of the core symptoms of ASD (ie, impaired social interactions, deficits in communication and repetitive or restricted behavioral patterns) is abnormal sensory processing. Preliminary studies indicate that the chiropractic adjustment may attenuate sensorimotor integration based on somatosensory evoked potentials studies.

Conclusion: We encourage further research for definitive studies on chiropractic's effectiveness for ASD. However, given the ineffectiveness of pharmaceutical agents, a trial of chiropractic care for sufferers of autism is prudent and warranted.

Key words: autism, chiropractic, spinal manipulation

(Explore 2011; 7:384-390. *© 2011 Elsevier Inc. All rights reserved.)*

INTRODUCTION

The *Diagnostic and Statistical Manual of Mental Disorders*, 4th Edition (*DSM-IV*) defines three core features of autism: qualitative deficit in social interaction, impaired communication, and stereotyped patterns of behavior.[1] According to the *DSM-IV*, and the International Classification of Diseases (10th Edition),[1,2] the term Autism Spectrum Disorder (ASD) includes not only Autistic Disorder but also Asperger's syndrome, Pervasive Developmental Disorder–Not Otherwise Specified (PDD-NOS), Rett's syndrome, and childhood disintegrative disorder. For the purpose of this article, we use the term autism and ASD interchangeably unless otherwise specified. ASD diminishes the overall quality of life of the affected individual as well as their family and represents a great burden to society. The disorder impacts a family's finances, employment, and time, and not surprisingly, it places the parents and siblings of children with ASD at risk for great psychological distress.[3-6] In 2006, on average, approximately 1% or one child in every 110 was classified as having ASD based on 11 Autism and Developmental Disabilities Monitoring (ADDM) network sites in the United States.[7] Recent estimates place the lifetime cost to care for an individual with ASD at $3.2 million and approximately $35 billion for the entire birth cohort.[8]

Given the heterogeneity of the disorder, treatments that may be effective are typically multidisciplinary and may include auditory training, discrete trial training, vitamin therapy, antiyeast therapy, facilitated communication, music therapy, occupational therapy, physical therapy, and sensory integration.[9,10] According to the Centers for Disease Control and Prevention (CDC),[10] these different care approaches can generally be categorized as: behavior and communication approaches (ie, applied behavior analysis), dietary approaches (ie, elimination of certain foods and use of vitamins and minerals), medication (ie, to address comorbidities), and complementary and alternative medicine (CAM) therapies.

Of the various practitioner-based CAM therapies used by the American population at large, chiropractic is the most popular and highly utilized by children.[11] Anecdotes and testimonials abound within the chiropractic profession on the benefits of chiropractic care for children with autism. This article seeks to use a systematic review to examine to what degree these claims are supported by the scientific literature.

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MATERIALS AND METHODS

A comprehensive search was performed on the chiropractic care of children (age ≤18 years) with ASD. The following electronic databases were searched: MANTIS [1965-2010]; ICL [1984-2010]; Pubmed [1966-2010]; EMBASE [1974-2010], AMED

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Alcantara - 2011

5 Total

3 Case Reports

One Cohort

One RCT

Clinical effects of spinal manipulation in the management of children and young adults diagnosed with autism spectrum disorder — a systematic review of the literature

By Sabine Kronau DO, MSc Paed Ost*, Bettina Thiel Dipl.-Ing.*, Anne Jäkel DPhil*, Torsten Liem DO, MSc Ost, MSc Paed Ost*

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Email: anne@annejakel.co.uk
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Conflict of interest: The authors of this manuscript declare no conflict of interest.

ABSTRACT

Background: Autism spectrum disorders (ASD) are classified as pervasive developmental disorders that permanently affect essential mental functions. Symptoms include quality-related disorders in areas of social interaction, verbal and non-verbal communication, the variability of behaviours and specific learning disabilities. Abnormalities in development are already apparent in early childhood. **Aim:** To identify evidence for the clinical benefits of manual therapy of the musculoskeletal system in children diagnosed with ASD. **Methods:** The following databases and search interfaces were searched from Database start up until October 2015: Bio Med Central, Chiropractic Library Collaboration, Clinical Trials, Cochrane library, Dimdi, EBSCO host, Pubmed, Pubmed central, Medline Plus, Osteopathic research Digital repository, Osteopathic Research Web, and Physiotherapy Evidence Database. Further searches included journals provided by the University of Wales and the University of Duisburg-Essen. Studies were included if participants were children and young adults aged 0-21 years; studies published in English, German, or French; a diagnosis of autism or ASD, and study designs of randomized clinical trial, case-control studies, case series, case reports, and single subject studies (N of 1), which include manual therapeutic interventions of the musculoskeletal system. Two authors independently screened the studies for inclusion criteria, extracted the data and assessed for risk of bias. Methodological quality of randomized clinical trials was assessed by the Downs and Black tool. Quality of reporting for case series and case reports was assessed with the appropriate checklists provided by the QUAlity and Transparency Of health Research (EQUATOR) network. **Results:** Included in the review were one randomized clinical trial (uncontrolled), one case series, and 11 case reports. The methodological quality of the included randomised clinical trial was rated as being poor. Quality of reporting for the included case series and case reports was also insufficient. All included studies used spinal manipulation, and indicated an improvement in autistic symptoms after the manual therapeutic intervention. **Conclusion:** The results of this systematic review confirm a general lack of good quality, high level of evidence studies on the topic, as well as no existing experimental studies that have been published in the last 10 years. This review indicates that the literature on the effects of chiropractic interventions to the musculoskeletal system of autistic children and young adults appears to be favourable with respect to the severity of their symptoms. However, the results of this review have to be interpreted with great caution, as the majority of identified studies were case reports. Further feasibility and pilot research is needed to lay the foundation for good quality clinical trials of spinal manipulation in the autistic child population.

Introduction

Autism spectrum disorders (ASD) are defined as a range of conditions classified as neurodevelopmental disorders, including autistic disorder (autism), Asperger syndrome, and pervasive developmental disorder (PDD).[1] Symptoms are quality-related disorders in the areas of social interaction, verbal and non-verbal communication, and a variety of behaviours and learning disorders.[1] Abnormalities in development are apparent already in early childhood and have a high variability.[1,2] ASD is reported to occur in all racial, ethnic and socioeconomic groups, with about 1 in 68 children being identified with ASD in 2012 in the US.[3] Boys seem to be 4.5 times more often affected than girls.[3]

With respect to the causation of autism, no universally accepted explanations are currently present. The possibility of a genetic component, environmental triggers and imbalances in the neurophysiological state are all discussed.[4-6] No specific medication is available to address autism Medication is generally used to treat accompanying symptoms and modify behaviors of the condition.[7] Current clinical guidelines recommend a combination of behavioral, devel-

Kronau – 2016

Total - 13

RCT – 1

Case Series – 1

Case reports - 11

Rated studies based on quality

REVIEW OF LITERATURE

Autism & Chiropractic: A Selective Review of Literature

Michael W. Shreeve DC, L.C.P, D.Ph.C.S.[1] & Ariel R. Troxel DC, M.Ed.[2]

Abstract

Objective: To evaluate current research on chiropractic in the management of children with a diagnosis of autism.

Methods: The search included PubMed, Cochrane and Google Scholar with key word search 'Chiropractic' + 'Autism'. Additionally, the references of those published materials were reviewed.

Results: Eleven studies related to the treatment and outcomes of children with autism undergoing chiropractic were retrieved.

Conclusion: Research has shown that there appears to be a relationship between chiropractic neurological intervention and positive outcomes with improved behavior in individuals with autism. Further research is necessary to explore the role of chiropractic in the management of children with autism.

Key Words: *Autism, chiropractic, adjustment, subluxation, upper-cervical, pediatric*

Introduction

The literature reviewed, highlights instances of individuals and families who found help in dealing with a diagnosis of autism. In a search for answers to "how can I help my child?", there are instances illustrated here, which can further provide hope for families. In addition to the literature provided, the question is proposed that given the association between craniocervical junction disruptions and sensory-motor difficulties, is it important to further study this area in order to provide greater resources for parents and families as they make health care choices for their children.

Autism Defined: The DSM-V revision produced in May 2013 provided changes to the way autism and similar disorders are defined and diagnosed. Autism Spectrum Disorder (ASD) has now been designed to include Autistic Disorder (classic autism), Asperger's Disorder, Pervasive Developmental Disorder – Not Otherwise Specified (PDD-NOS), and Childhood Disintegrated Disorder. Rett's Syndrome is no longer considered part of the ASD spectrum.[1]

The new definition includes three social and communication deficits: problems reciprocating social or emotional interaction, severe problems maintaining relationships, and non-verbal communication problems. The new definition considers repetitive and restrictive behaviors. The presence of two of the following four behaviors is a strong indication of a positive diagnosis of autism: 1) extreme attachment to routines and patterns and resistance to changes in routines, 2) repetitive speech or movements, 3) intense and restrictive interests, and/or 4) difficulty integrating sensory information or strong seeking or avoiding behavior or sensory stimuli.[2]

Previously, language delay was a significant factor in diagnosis in classic autism, but under the new definition of ASD, language delays are not included as part of the criteria for diagnosis.[1]

In reviewing the literature, various authors have discussed the definition to be a developmental disorder that shows deviance and delay in social interaction, communication and behavior. Some authors have also delved into the further definition to be a neurological disorder revealing cognitive delay, due to the

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Shreeve 2018

11 Studies

DEVELOPMENTAL DELAY SYNDROMES: PSYCHOMETRIC TESTING BEFORE AND AFTER CHIROPRACTIC TREATMENT OF 157 CHILDREN

Scott C. Cuthbert, DC, and Michel Barras, DC

ABSTRACT

Objective: This study presents a case series of 157 children with developmental delay syndromes, including the conditions such as dyspraxia, dyslexia, attention-deficit hyperactivity disorder, and learning disabilities who received chiropractic care.
Clinical Features: A consecutive sample of 157 children aged 6 to 13 years (86 boys and 71 girls) with difficulties in reading, learning, social interaction, and school performance who met these inclusion criteria were included.
Intervention and Outcomes: Each patient received a multimodal chiropractic treatment protocol, applied kinesiology chiropractic technique. The outcome measures were a series of 8 standardized psychometric tests given to the children by a certified speech therapist pre- and posttreatment, which evaluate 20 separate areas of cognitive function, including patient- or parent-reported improvements in school performance, social interaction, and sporting activities. Individual and group data showed that at the end of treatment, the 157 children showed improvements in the 8 psychometric tests and 20 areas of cognitive function compared with their values before treatment. Their ability to concentrate, maintain focus and attention, and control impulsivity and their performance at home and school improved.
Conclusions: This report suggests that a multimodal chiropractic method that assesses and treats motor dysfunction reduced symptoms and enhanced the cognitive performance in this group of children. (J Manipulative Physiol Ther 2009;32:660-669)
Key Indexing Terms: *Chiropractic; Developmental Delay Disorder; Apraxias; Dyslexia; Learning Disorders*

Chiropractic treatment of developmental delay syndromes (DDSs), a term that encompasses conditions such as dyspraxia, dyslexia, learning disabilities, and attention-deficit hyperactivity disorder (ADHD), has shown some interest.[1] The need for more observational and experimental studies in this area has also been pointed out.[2]

It has been shown that motor discoordination, especially affecting the postural and ocular muscles, is a common comorbid condition associated with this spectrum of disorders.[3-7]

At this time, DDSs are thought to have multifactorial etiologies.[3,4,8-11] The epidemiologic prevalence of these disturbances has been estimated to be as high as 5% to 20% (depending on a conservative definition).[10,11]

Over the past decade, there has been an increase in the number of DDS-related visits to health care providers, and the percentage of children with severe behavioral and language problems is increasing.[12] A study by the US Department of Education stated that more than 50% of minority and nonminority children are not reading at their grade level.[13] With the increase of methylphenidate use by 700% since 1990,[14] and because last year, doctors in the United States wrote an estimated 20 million prescriptions for methylphenidate, it is obvious why parents and children with DDS come to chiropractors and other physicians for help.

In a survey of children with DDS (specifically ADHD), 67.6% of families reported current or past use of complementary and alternative medicine to manage this condition, including chiropractic, modified diet, and vitamins, minerals, and dietary supplements.[15] The natural history of DDS is also a challenge. Medications are often used for these children, but these medications do not necessarily normalize these children's function.[16] In children treated pharmacologically, subtle and not-so-subtle neurocognitive impairments often persist into adulthood.[16-19] Problems with DDS are likely to affect employment status, educational achievements, health care consumption, traffic and other accidents, and criminality.

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Chiropractic Care and Behavior in Autistic Children

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INTRODUCTION

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John D. Grostic, D.C., Bruce Pfleger, PH.D, M.S. *Sid E. Williams Research Center, Life University School of Chiropractic, Marietta, Georgia.*

AUTISM[8] CHARACTERISTICS

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6. Absence of delusions, hallucinations, loosening of associations, and incoherence as in schizophrenia.

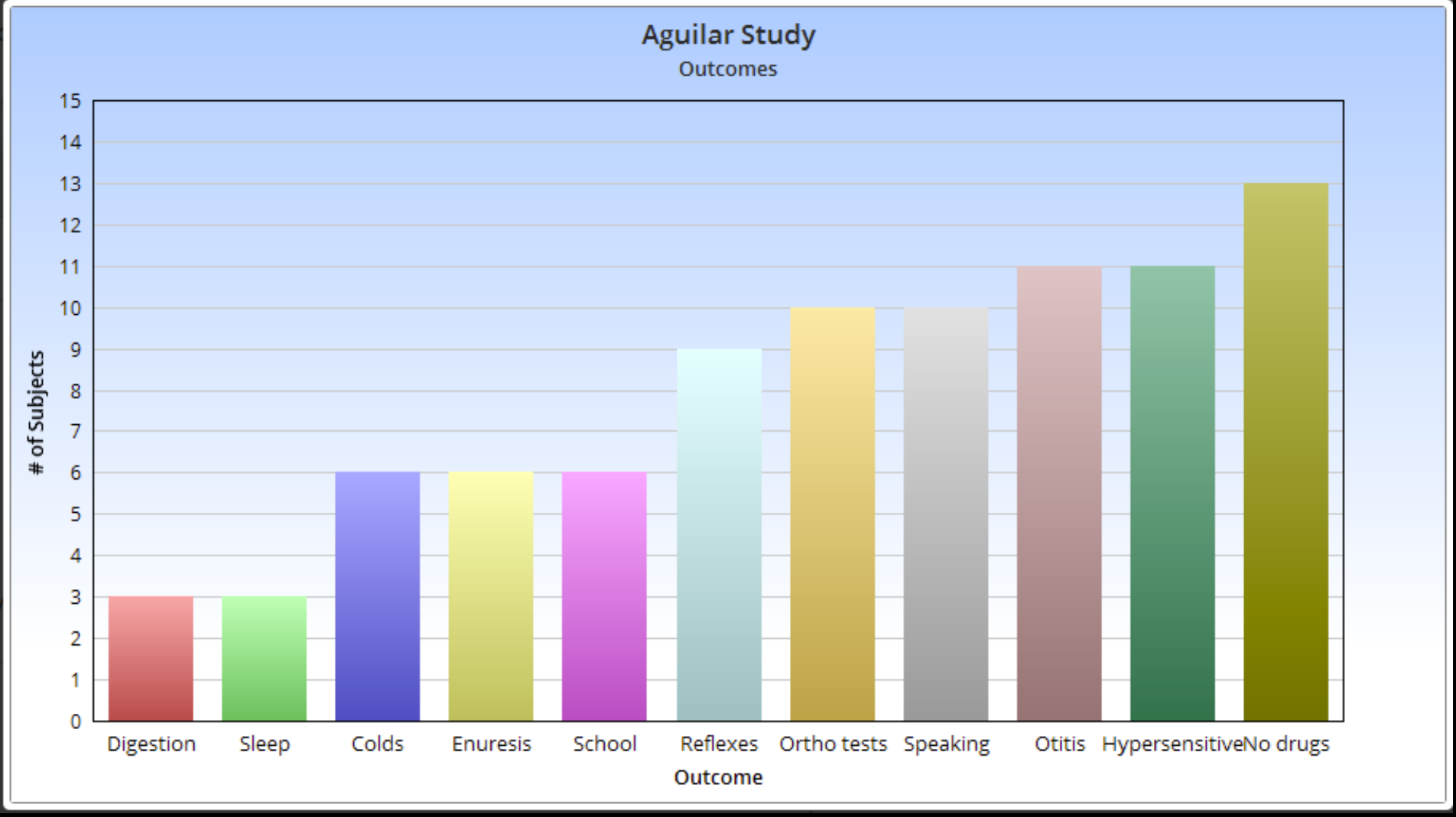
FEATURES

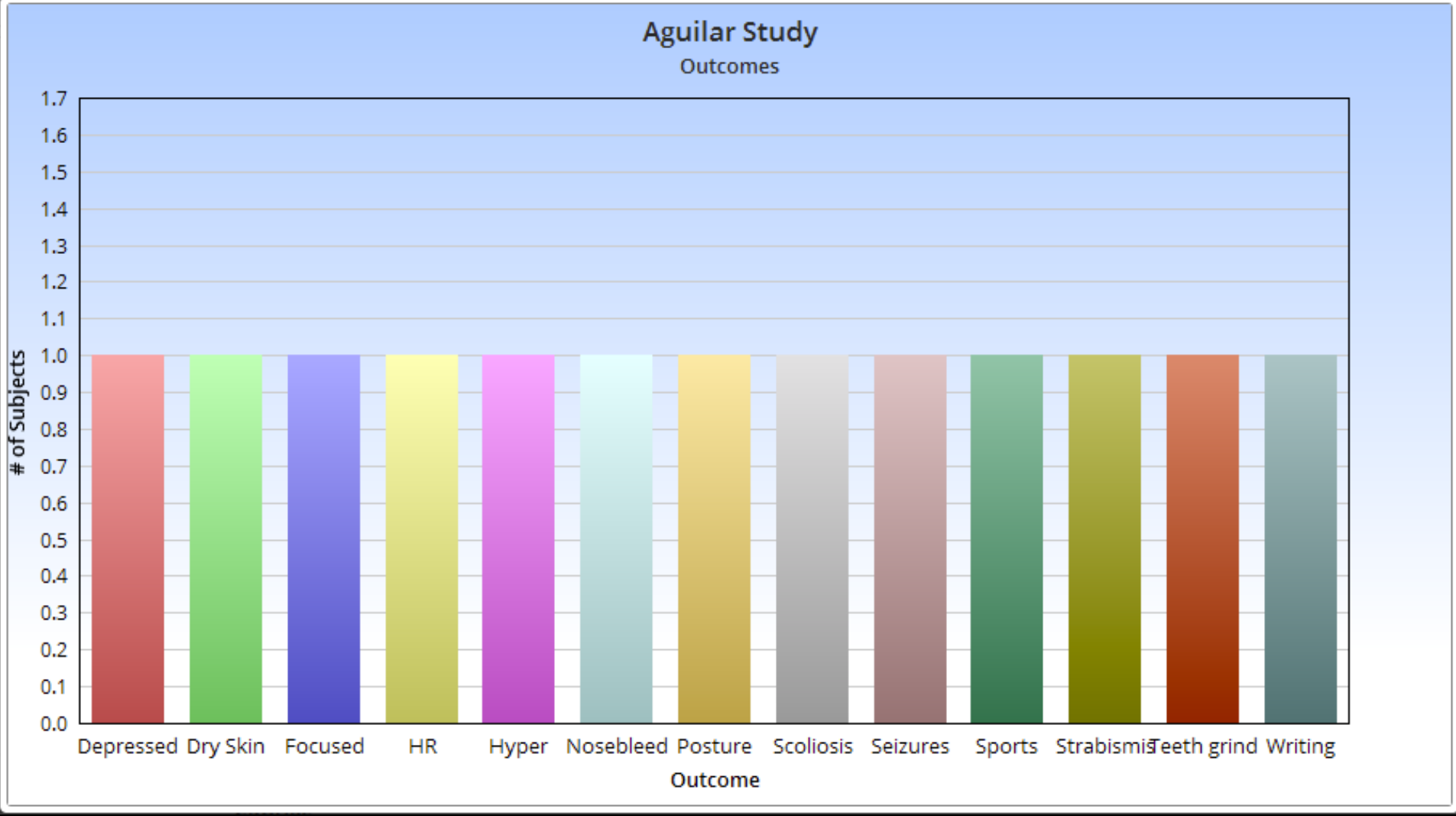
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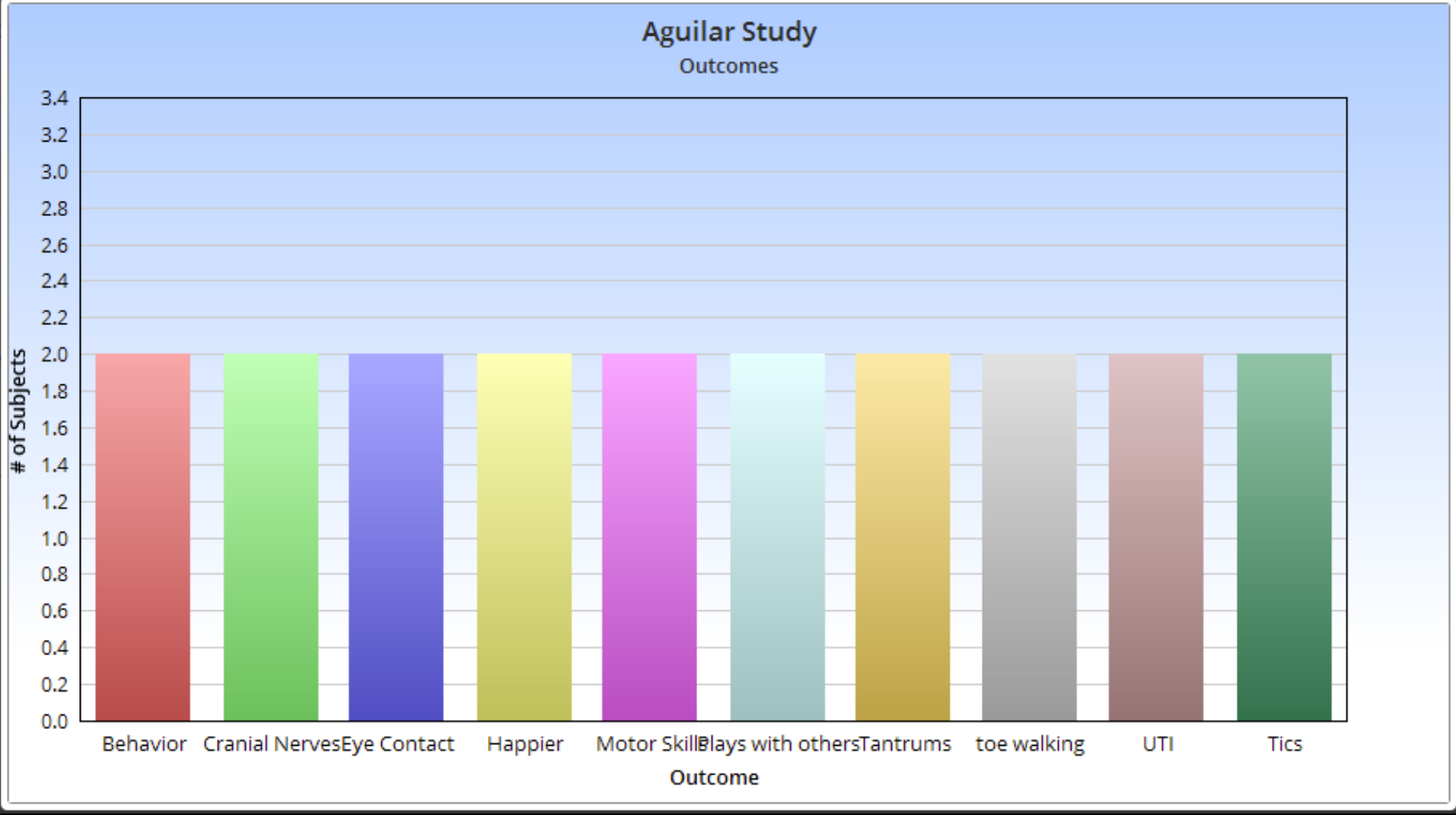
2000 – Aguilar

26 Subjects

21 Males
5 Females


Aguilar Study
Outcomes
# of Subjects
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Digestion
Sleep
Colds
Enuresis
School
Reflexes
Ortho tests
Speaking
Otitis
Hypersensitive
No drugs
Outcome


Aguilar Study
Outcomes
# of Subjects
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Depressed
Dry Skin
Focused
HR
Hyper
Nosebleed
Posture
Scoliosis
Seizures
Sports
Strabismis
Teeth grind
Writing
Outcome


Aguilar Study
Outcomes
# of Subjects
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Behavior
Cranial Nerves
Eye Contact
Happier
Motor Skills
Plays with others
Tantrums
toe walking
UTI
Tics
Outcome

Case Studies . . .



CASE STUDY

Improvement in a 3½-year-old Autistic Child Following Chiropractic Intervention to Reduce Vertebral Subluxation

Nick Hoffmann B.S.,D.C.[1] *David Russell B.S.,D.C.*[2]

ABSTRACT

Objective: To describe, discuss and track the subjective and objective changes of a 3½ year old autistic girl following chiropractic adjustments over a 10 week period.

Clinical Features: A 3½ year old female child with reduced social interaction and language skills and learning difficulties presented for chiropractic care. The child had been diagnosed with autism 1 year earlier.

Interventions and Outcomes: The child received full spine adjustments where indicated to reduce vertebral subluxation, using the Torque Release Technique protocol and Integrator™ instrument. Strong verbal and physical apprehension to initial care was observed, however no signs of this were present after 5 visits, along with further improvements in social interactions, language skills and increased symmetry in surface EMG and thermal scanning over the 10 weeks of care.

Conclusion: The subjective and objective improvements observed by both practitioner and parents following chiropractic care indicate a link between subluxation and autistic behavioral patterns. Comparable studies have been undertaken previously with similar findings, however further study needs to be conducted to determine the exact relationship between chiropractic care and behavioral changes in autistic children.

Key Words: *autism, chiropractic care, Torque Release Technique, Integrator™, subluxation, pediatric, surface EMG, thermal scanning.*

Introduction

Autism can be defined as a behavioral developmental disorder generally presenting in children in the first 18 months of life.[1] Individuals with autism can be affected in different ways, but all seem to suffer from a triad of abnormalities: difficulty in interacting with others, impairments in communication, and difficulty in thinking imaginatively.[1,2] The estimated population of people with autism in New Zealand is approximately 40,000 or 1 in every 100 people.[3]

Many causes of autism have been speculated but no definitive conclusion has been reached. Genetic associations along with internal and external environmental stimuli, both in-utero and at any stage post partum are the most accepted theories regarding etiology.[2-4] No matter the cause, it is clear that all those affected by autism have problems with sensory-neural integration and consequent motor output.[5]

Case Report

A 3½ year old girl was brought in for chiropractic care after being diagnosed 12 months prior with autism. The child did not speak or communicate with anyone except through screaming and tantrum like outbursts. She would not socialize at all with others her age and did not engage in physical activity other than that initiated during a tantrum. Constipation was noted at several stages of her life as was difficulty sleeping. Watching videos on television appeared to have a calming affect on her.

The mother described the birth as non-traumatic however the child was delivered via vacuum extraction with the mother receiving an epidural. Immediately following birth the child was separated from her mother and a vitamin K injection was administered within a heel prick. All standard vaccinations were administered and the child was reported to have reacted *differently* to other children. She slept for 24 hours after receiving the first series of vaccinations. The child suffered a fall from her cot at 5 months of age with no noticeable damage

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CASE STUDY

Improvement in a 6 year-old Child with Autistic Spectrum Disorder and Nocturnal Enuresis under Upper Cervical Chiropractic Care

Allison Noriega, DC,[1] Jonathan Chung, DC,[2] Justin Brown, DC[2]

ABSTRACT

Objectives: To report on the improvement of a pediatric patient with nocturnal enuresis and Autistic Syndrome Disorder (ASD), after undergoing upper cervical specific chiropractic care.

Clinical Features: A 6 year-old boy who presented for chiropractic care with a history of nocturnal enuresis and ASD. The child experienced a traumatic birth and at the time of chiropractic care was following the Defeat Autism Now! (DAN!) Protocol.

Intervention and Outcomes: An atlas subluxation complex was determined based on clinical data collected at the first visit. Objective clinical evaluation included: static palpation, motion palpation, radiographs, paraspinal thermography, supine leg length inequality, as well as measurements of hip leveling, and bilateral weight distribution. National Upper Cervical Chiropractic Association (NUCCA) upper cervical specific adjustments were administered over a 15-week period. There was an overall reduction in the patient's pattern of atlas subluxation, in addition to successful resolution of nocturnal enuresis and marked improvement in both his social interactions and learning difficulties at school.

Conclusions: The case presentation of a 6 year-old boy with nocturnal enuresis and Autistic Spectrum Disorder who underwent upper cervical chiropractic care is described. The reduction of vertebral subluxation was related in time with the resolution of nocturnal enuresis and significant improvements in behavioral patterns. Further research in both subject areas is advocated.

Key Words: *nocturnal enuresis, chiropractic, subluxation, upper cervical, children, autism*

Introduction

Primary nocturnal enuresis, or bed-wetting, affects five to seven million children over the age of six in the United States.[1, 2] Embarrassment, lack of control, and low self-esteem are only a few emotional repercussions that the child endures. However, it is not only the child who is affected, the family also faces it's own psychological challenges and economic impacts that are involved in caring for the child.[3,4] Ward-Smith and Barry[1] describe bedwetting as the cause of this psychological distress, rather than the result of psychological distress.[1, 4]

The Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV), defines the criteria for enuresis to be: voiding of urine at least two occurrences per week for at least 3 months; the child must be at least 5 years of age

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CASE STUDY

Improvement in a Child with Pervasive Developmental Disorder Undergoing Chiropractic Care

Morgan Handt, D.C.[1]

Abstract

Objective: The purpose of this paper is to report on the outcomes of a three year-old boy diagnosed with Pervasive Developmental Disorder (PDD) undergoing chiropractic care.

Clinical Features: A three year old boy, who was diagnosed with Pervasive Developmental Disorder by a developmental pediatrician. The child had communication problems, apraxia, and speech delay.

Intervention and Outcomes: The patient received chiropractic care over the course of 5 months. The care consisted of Diversified technique adjustments to the upper cervical and sacral regions, balancing exercises, kinesiotaping of bilateral foot overpronation, and diet modification. The outcomes were measured by re-assessments, parental evaluation and health care provider and teacher reports. The child began making friends, became more interactive, less defiant and was reported to be an overall happier child following the introduction of chiropractic care.

Conclusions: Following the introduction of chiropractic care and lifestyle changes this child experienced an improvement in his quality of life. Further research into the role of chiropractic and lifestyle changes is called for in this population of children.

Key Words: *Autism spectrum, Pervasive developmental disorder, children, chiropractic, pediatrics, sensory deficit disorder, developmental delay, vertebral subluxation*

Introduction

Autism Spectrum Disorder (ASD), made up of Asperger's Syndrome, Rett's Syndrome, Childhood Disintegration Disease, Pervasive Developmental Disorder Not Otherwise Specified (PDD NOS), and Autistic Disorder[1], is a developmental condition[2] with no known etiology. Parent's usually become suspicious of their child's behavior around 18 months of age when regression of certain behaviors and actions begin.[3] The diagnosis of autism is based on behavior, not on diagnostic testing such as advanced imaging or laboratory tests.[1] A child is diagnosed with autistic disorder on the basis of qualitative impairments in social interaction skills, communication skills, and repetitive or restrictive behavior and/or interests. Also noted are a lack of meaningful language skills, empathic abilities, motor incoordination, and problems with executive functioning.[4] Nearly 50% of children with autism never develop communicative speech and therefore become easily distressed with normal every day life occurrences and activities.[1]

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CASE STUDY

Improvement in Autism Spectrum Disorder Following Vertebral Subluxation Reduction: A Case Study

Ari Cohn D.C.[1]

Abstract

Objective: To review and discuss successful chiropractic care in the case of a three year old male with Pervasive Developmental Disorder and Sensory Processing Disorder.

Clinical Features: A three year old boy presented with a diagnosis of Pervasive Developmental Disorder and Sensory Processing Disorder. His diagnosis was based upon observed developmental delays in the areas of communication skills and speech, cognitive function, gross and fine motor skills, ambulation, social and emotional development, and adaptive and self-help skills.

Interventions and Outcomes: Subjective data was collected from direct interview of the patient's mother as well as reports provided by the occupational therapists and physical therapists who provided care to the child. The objective data relating to chiropractic care had been obtained from static palpation of the patient's spine, surface electromyography and paraspinal thermography performed to determine the presence of components of vertebral subluxations. Diversified adjustments were used to reduce vertebral subluxations. Improvements were noted after four months of care.

Conclusion: This case demonstrates a link between chiropractic subluxation management and improvement of symptoms of Pervasive Developmental Disorder and Sensory Processing Disorder. More research in this area is warranted.

Key words: *Developmental delays, Developmental Delay Syndrome, Pervasive Develomental Delays, PDD, Autism Spectrum Disorders, ASD, Chiropractic, Subluxations, Pediatric, Learning disabilities, speech delay, motor skills, neurodevlepmental disorder, diversified technique, thermography, surface electromyography*

Introduction

The term Pervasive Developmental Disorders (PDD) refers to a group or range of disorders characterized by a variety of delays in the development of socialization and communication skills.[1,2] Symptoms may be seen as early as infancy and will typically show up before 3 years of age.[1,2] These symptoms generally include: problems with using and understanding language; difficulty relating to others, objects, and events; unusual play with toys and other objects; difficulty with changes in routine or familiar surroundings; and repetitive body movements or behavior patterns.[1,2]

The diagnosis of PDD can include disorders within the autism spectrum.[1] Autism Spectrum Disorders (ASD) are a group of developmental brain disorders characterized by impaired

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The patient's mother reported that her son's communication skills had improved dramatically, he was walking and even starting to run, his bruxism had reduced and his language skills had improved overall. She also reported that the occupational and physical therapists that were working with him had stated that they had never had a case improve this dramatically in such a short time period.

Improvement in Autistic Behaviors Following Chiropractic Care: A Case Series

Jesse Cleave BChiro[1], Joel Alcantara DC[2], Kelly Holt BSc(Chiro), PGDipHSc[3]

Abstract

Objective: To describe two cases of individuals diagnosed with autism undergoing chiropractic care.

Clinical features: Case one involves a 20 year old autistic male who displays aggressive behavior towards others. Case two is a 17-year-old autistic female who abuses herself.

Intervention and outcome: Both patients received a trial of chiropractic care for 5 and 4 months respectively with visit frequency of once per week. Both patients responded favorably to chiropractic care with the male patient decreasing in aggressive behavior and the female patient decreasing in self-abuse and improved socialization.

Conclusion: Two cases of individuals who suffered from autism are presented. Each had favorable results after undergoing chiropractic care. This case series provides supporting evidence that individuals with autism may benefit from chiropractic care. More research is warranted in this area.

Key indexing terms: *autism, autistic disorder, autistic spectrum disorder, chiropractic, vertebral subluxation*

Introduction

Autism is a neurodevelopmental disorder characterized by abnormal social interaction and communication concurrent with repetitive behaviors and mannerisms[1-3] which affect approximately one in every hundred people in New Zealand.[4] The causes of autism are currently unknown.[2,3] Suffice it to say, the possible etiologies involve environmental, biological and genetic factors. Currently, biological testing to diagnose autism does not exist, therefore diagnosis is based on clinical observations using a set of criteria established in the Diagnostic and Statistical Manual of Mental Disorders, 4th edition.[5,6]

The three core symptoms of autism involve impairments in social interaction, verbal and non-verbal communication, and displays of repetitive or restricted behavioral patterns in activities and interests.[5,6] No effective pharmacological intervention exists for the disorder and prescribed medications are meant to address co-morbid symptoms such as attention deficit hyperactivity disorder, obsessive compulsive disorder and clinical depression.[7]

Not surprisingly, the use of complementary and alternative medicine (CAM) for individuals with autism is becoming more popular.[8] This is partially due to parental concerns regarding the safety and effectiveness of pharmacological interventions, especially in the context of "off-label"

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CASE SERIES

Improved Language Development Following Network Spinal Analysis in Children Diagnosed with Autism Spectrum Disorder

Karen Lumb, D.C.[1] & Karen Feeley, D.C.[2]

Abstract

Objective: To describe the care of two children diagnosed with Autism Spectrum Disorder and the documented changes in their language skills while receiving Network Spinal Analysis (NSA) chiropractic care.

Clinical Features: Two children, under the age of 4 diagnosed with autism spectrum disorder, received NSA care for one year. The specific outcome that was measured was the Preschool Language Scale-4 (PLS-4). The PLS-4 was given four times over a one year period.

Results: Expressive and receptive language delays were assessed before, during, and after NSA care. These children saw an average increase of 24 months of language development in one year, while under NSA care.

Conclusions: The progress documented in this report suggests that NSA care may have positively affected the language development of these children. We support further research in this field.

Keywords: *vertebral subluxation, autism, autism spectrum disorder, language development disorders, Chiropractic, Network Spinal Analysis*

Introduction

Autism is defined as a disorder beginning in childhood marked by the presence of significantly abnormal or impaired development in social interaction and communication and a distinctly restricted repertoire of activity and interest.[1] A range of other nonspecific problems are common, such as phobia, sleeping and eating disturbances, temper tantrums, and aggression, typically self-directed.[2] Most children identified as having autism are reported by their caregivers to demonstrate symptoms within the first two years of life, based on retrospective accounts.[3]

Social and communication impairments are the earliest indicators of autism. These become apparent early in childhood and continue through adulthood. Social impairments in infants with autism include decreased attention to social stimuli, reduced smiling, reduced eye contact, and diminished orientation to name. Three to five year old autistic children have difficulty with social understanding, approaching others spontaneously, imitating and responding to emotions, nonverbal communication, and turn-taking.[4]

Communication deficits are present in an estimated one third to one half of individuals diagnosed with autism.[5] Autistic toddlers have less frequent and less diverse babbling, consonants, words, and word combinations; their gestures are less often integrated with words. Children with autism have difficulty making requests, sharing experiences, and are more likely to exhibit echolalia, the imitation of speech of others.[6]

The use of many conventional gestures such as showing, waving, pointing, and symbolic gestures like head nodding are

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Case Study

An Epidemiological Approach to the Effects of Subluxation-Based Chiropractic Care on a Child with Autism, Acid Reflux, Headache, Seizures, and Vomiting: A Case Study and Review of the Literature

Eric Zielinski B.A.[1]
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Abstract

Objective: We present the findings in which a three year girl received results and symptom relief from common neurological autism spectrum manifestations (ASD), acid reflux, vomiting, and seizures as a result of subluxation-based chiropractic care.

Clinical Features: Thirty five month old girl presented into the office with history of bilateral, intermittent headaches, epilepsy, behavioral and developmental delay, acid reflux, sleep disturbances, and vomiting.

Interventions and Outcomes: Subluxation-based specific chiropractic care was administered to the patient which resulted in complete resolution of bilateral head pain, acid reflux, vomiting, and sleeplessness. Significant improvements in ASD manifestations were also noted including calm behavior, increased eye contact, happier demeanor, improved attitude, increased focus and attention and an initiation to sound out words. She continues to progress as is evidenced by a significantly increased vocabulary, continued improvement in attention and focus, and complete lack of epileptic episodes.

Conclusions: The improved outcomes of a child with ASD undergoing chiropractic management to reduce vertebral subluxation is described. We suggest that chiropractic care should be part of the multidisciplinary management of ASD and that further research in this area be conducted.

Keywords: *Chiropractic; vertebral subluxation; thermography; motion palpation; pediatric; developmental delay; autism; ASD; seizures; GERD; sleeplessness*

Introduction

Epidemiologist Albert Benenson defines *epidemic* as, "The occurrence in a community or region of excess of an illness (or an outbreak) with a frequency clearly in excess of normal expectancy."[1] In light of this definition, it is clear that we are in the midst of a worldwide Autism Spectrum Disorder (ASD) *epidemic*. On a national level, it has been reported that autism rates have doubled from 1966 to 1997,[2] then spiked 26.01% between 1998 to 1999.[3]

Individual states have documented staggering ASD prevalence that shadows the national numbers. Within the state of California, for example, the number of children entered into the autism registry increased by 210% between 1987 and 1998.[2] See below for the occurrences reported by the U.S. Department of Education (USDE) since the early 1990s.

Etiological Considerations

Autism is a condition often characterized by a failure to bond, lack of social interaction, avoidance of eye-to-eye contact, difficulties in language development, and repetitive behaviors known as "stimming" (self-stimulation).[3] Milder forms of this condition exist such as Asperger's Syndrome, PDD (Pervasive Development Disorders) and ADD/ADHD. All these issues are known collectively as Autism Spectrum Disorder(s), or ASD. Children with characteristics of an ASD may have comorbid conditions including: Fragile X syndrome (which causes mental retardation); tuberous sclerosis; epileptic

Resolution of Autistic Symptoms in a Child Undergoing Chiropractic Care to Correct Vertebral Subluxations: A Case Study

Tai A. Scelfo, D.C.[1] & Patricia L. Chelenyak, D.C.[2]

Abstract

Objective: To describe successful chiropractic care of a child with autism.

Clinical Features: A 9-year-old boy with chronic ear infections, difficulty with social interactions, and impairment of communication presented for chiropractic care. The child was first diagnosed with Pervasive Developmental Disorder (PDD), and later, diagnosed with Autism.

Intervention and Outcomes: Diversified and toggle-recoil techniques were utilized in this case study. A nutritionist also administered digestive enzymes as part of care. Signs of improved social skills were apparent after the fourth visit, along with language development acknowledged on the seventh visit. The parent also reduced use of medication.

Conclusion: Through the correction of vertebral subluxation, significant improvements were noted by parent and doctor. Further studies need to be conducted to demonstrate that the correction of subluxation correlates with increased functioning of the autistic child.

Key Indexing Terms: *Autism; Chiropractic; Vertebral Subluxation; Diversified; Toggle-Recoil*

Introduction

Autism is a neurobehavioral disorder that has shown an increases in prevalence in the children of this era. It affects more than 400,000 in the United States and ranks as the third most common developmental disorder of the pediatric population.[1] Autism affects more boys than girls with a ratio of 4:1.[2] Signs become present usually by 18 months of age.[2-4]

In a review of the literature regarding neurobehavioral disorders and chiropractic, 10 studies were found. Each case study consisted of chiropractic care and the majority addressed subluxation to help the patient gain balance in the nervous system.

Bedell reported a case of a 7-year-old girl with attention and focusing problems in school, hyperactive behavior, sleep disturbances, and aggressive behavior toward her sister. The child was cared for using Torque Release technique and Craniosacral therapy. Over 90-days of care, the child showed improvement in behavioral assessments and positive attitude changes.[5]

In a study by Lovett and Blum, a case was presented of an 8-year-old child with learning and behavioral disorders associated with ADHD, relating to a fall that occurred 18 months prior to chiropractic care.[6] Treatment consisted of SOT pelvic blocking and cervical adjustments and took place

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CASE STUDY

Improvement in Autism in a Child Coupled with Reduction in Vertebral Subluxations: A Case Study & Selective Review of the Literature

Nicholas SC Marini, B.S., D.C.[1] & Stephen C Marini, M.S., D.C., PhD[2]

Abstract

Objective: To describe and discuss the objective and subjective changes in a 6 year old male child following chiropractic care over a period of 16 weeks who was originally diagnosed with Autism.

Clinical Features: A 6 year old boy presents with reduced social interaction, altered behavioral patterns, language deficits, and learning difficulties. The child was previously diagnosed with Autism by a neurologist after brain pathology was ruled out. The child was up to date with all vaccinations per the recommended medical schedule.

Interventions and Outcomes: Objective data, such as static palpation, motion palpation, and leg checks were used to determine the presence of vertebral subluxations in the child. The Autism Treatment Evaluation Checklist (ATEC) was also used. A chiropractic adjustment schedule along with dietary and supplementation recommendations were advised at the initial visit. Diversified, Thompson Drop Assisted techniques, and trigger point therapies were used to reduce the subluxations that were found. Over the 16 week period, where adjustments were given regularly, a reduction in vertebral subluxation patterns and an improved ATEC score were noted. Improvements in learning abilities, social interactions, language skills, and behavioral patterns were also noted.

Conclusion: In this case, a possible link between chiropractic care and the reduction of autistic signs and symptomatology is indicated due to the improvements in subjective and objective findings. Studies of a similar nature have been conducted previously with similar outcomes. However, more research needs to be conducted in order to evaluate the precise connection between vertebral subluxation, chiropractic care, Autism, and other Autistic-like Disorders.

Key Words: *Autism, Chiropractic, Subluxation, Pediatric, ATEC, Diversified technique, Thompson technique*

Introduction

Autism is defined as a brain development disorder that causes impaired social interaction, decreased communication ability, restrictive repetitive or stereotypical behaviors, and decreased cognitive and learning abilities. [1, 2] The prevalence of autism in the United Kingdom has been reported by Chakrabarti et al to be 16.8 per 10,000 in 2001 [3] and 22.0 per 10,000 in 2005.[4] In the United States the number of people with autism ages 6-21 has risen from 5,145 in 1991-1992 to 118,602 in 2001-2002. The increase in students in the United States with autism has risen 1700% in that same time period.[5] This has profound implications not only on the population but also on the economy for it is estimated that as of 2000, $18,581,511,000 is spent annually in the United States for children with autism and autistic like disorders in their education.[5]

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ARI/Form
ATEC-1/11-99

Autism Treatment Evaluation Checklist (ATEC)

Bernard Rimland, Ph.D. and Stephen M. Edelson, Ph.D.
Autism Research Institute
4182 Adams Avenue, San Diego, CA 92116
fax: (619) 563-6840; www.autism.com/ari

Project/Purpose:				
Scores: I	II	III	IV	Total

This form is intended to measure the effects of treatment. Free scoring of this form is available on the Internet at: www.autism.com/atec

Name of Child _____ _____ ☐ Male Age _____
Last First ☐ Female Date of Birth _____
Form completed by: _____ Relationship: _____ Today's Date _____

Please circle the letters to indicate how true each phrase is:

I. Speech/Language/Communication:

[N] Not true [S] Somewhat true [V] Very true

N S V 1. Knows own name
N S V 2. Responds to 'No' or 'Stop'
N S V 3. Can follow some commands
N S V 4. Can use one word at a time (No!, Eat, Water, etc.)
N S V 5. Can use 2 words at a time (Don't want, Go home)
N S V 6. Can use 3 words at a time (Want more milk)
N S V 7. Knows 10 or more words
N S V 8. Can use sentences with 4 or more words
N S V 9. Explains what he/she wants
N S V 10. Asks meaningful questions
N S V 11. Speech tends to be meaningful/ relevant
N S V 12. Often uses several successive sentences
N S V 13. Carries on fairly good conversation
N S V 14. Has normal ability to communicate for his/her age

II. Sociability:

[N] Not descriptive [S] Somewhat descriptive [V] Very descriptive

N S V 1. Seems to be in a shell – you cannot reach him/her
N S V 2. Ignores other people
N S V 3. Pays little or no attention when addressed
N S V 4. Uncooperative and resistant
N S V 5. No eye contact
N S V 6. Prefers to be left alone
N S V 7. Shows no affection
N S V 8. Fails to greet parents
N S V 9. Avoids contact with others
N S V 10. Does not imitate
N S V 11. Dislikes being held/cuddled
N S V 12. Does not share or show
N S V 13. Does not wave 'bye bye'
N S V 14. Disagreeable/not compliant
N S V 15. Temper tantrums
N S V 16. Lacks friends/companions
N S V 17. Rarely smiles
N S V 18. Insensitive to other's feelings
N S V 19. Indifferent to being liked
N S V 20. Indifferent if parent(s) leave

III. Sensory/Cognitive Awareness:

[N] Not descriptive [S] Somewhat descriptive [V] Very descriptive

N S V, 1. Responds to own name
N S V 2. Responds to praise
N S V 3. Looks at people and animals
N S V 4. Looks at pictures (and T.V.)
N S V 5. Does drawing, coloring, art
N S V 6. Plays with toys appropriately
N S V 7. Appropriate facial expression
N S V 8. Understands stories on T.V.
N S V 9. Understands explanations
N S V 10. Aware of environment
N S V 11. Aware of danger
N S V 12. Shows imagination
N S V 13. Initiates activities
N S V 14. Dresses self
N S V 15. Curious, interested
N S V 16. Venturesome - explores
N S V 17. "Tuned in" — Not spacey
N S V 18. Looks where others are looking

IV. Health/Physical/Behavior:

Use this code: [N] Not a Problem [MO] Moderate Problem [MI] Minor Problem [S] Serious Problem

N MI MO S 1. Bed-wetting
N MI MO S 2. Wets pants/diapers
N MI MO S 3. Soils pants/diapers
N MI MO S 4. Diarrhea
N MI MO S 5. Constipation
N MI MO S 6. Sleep problems
N MI MO S 7. Eats too much/too little
N MI MO S 8. Extremely limited diet
N MI MO S 9. Hyperactive
N MI MO S 10. Lethargic
N MI MO S 11. Hits or injures self
N MI MO S 12. Hits or injures others
N MI MO S 13. Destructive
N MI MO S 14. Sound-sensitive
N MI MO S 15. Anxious/fearful
N MI MO S 16. Unhappy/crying
N MI MO S 17. Seizures
N MI MO S 18. Obsessive speech
N MI MO S 19. Rigid routines
N MI MO S 20. Shouts or screams
N MI MO S 21. Demands sameness
N MI MO S 22. Often agitated
N MI MO S 23. Not sensitive to pain
N MI MO S 24. "Hooked" or fixated on certain objects/topics
N MI MO S 25. Repetitive movements (stimming, rocking, etc.)

SOT chiropractic care of a 6-year-old boy diagnosed with Asperger's syndrome and related conditions

Martin G. Rosen, DC, Charles L. Blum, DC

Introduction:

Asperger's syndrome is considered a high-functioning autism,[1] and although its exact cause is unknown, some research supports the likelihood of a genetic basis. It differs from other autism spectrum disorders by its relative preservation of linguistic and cognitive development. Although not required for diagnosis, physical clumsiness and atypical use of language are frequently reported.[2] There is no single treatment, and the effectiveness of particular interventions is supported by only limited data. Intervention is aimed at improving symptoms and function. The mainstay of management is behavioral therapy, focusing on specific deficits to address poor communication skills, obsessive or repetitive routines, and physical clumsiness. A 2003 review of epidemiological studies of children found prevalence rates ranging from 0.03 to 4.84 per 1,000, with the ratio of autism to Asperger's syndrome ranging from 1.5:1 to 16:1.[3] The field of chiropractic may play a part in the treatment of autism spectrum disorders[4] and sacro-occipital technique (SOT) and cranial techniques have been found to be of promise for improving symptoms and function.[5]

Case History:

A 6-year-old male patient was brought to my office in October 2000 for evaluation and treatment for several medically diagnosed conditions that had not responded to standard medical care. The patient had seen another chiropractor for 6 months, who then referred the patient for SOT and cranial chiropractic care at this office.

His initial complaints included: Asperger's Syndrome that resulted in uncontrollable "rocking, jumping and flapping" of his hands; asthma triggered by exertion; seasonal allergies and colds or bronchial congestion; and severe allergies to mold, dust, animal dander and seasonal triggers. Standard medications for the Asperger's "made his asthma and allergy symptoms worse." Therefore at the time of his initial office visit he was only taking asthma medication (Intal and Albuteral) and a multivitamin. His Asperger's symptoms started at age 3, and he had asthma and allergy symptoms since early childhood.

Methods - Treatment/Intervention:

A standard chiropractic, orthopedic and neurological exam was performed on the patient as well as a specific SOT (sacro-occipital technique) spinal and cranial evaluation. Cranial and spinal subluxations patterns were detected and a treatment program was implemented to address these patterns using SOT protocols and procedures.

The patient was initially treated as a category two (sacroiliac joint hypermobility) with active occipital fibers line two T3 and T7. His occiput was determined to be in left lateral flexion; he had right temporomandibular joint dysfunction (TMD) and cervical subluxations at C2 and C1. The category two stabilized in 3 weeks corresponding with improvement of his Asperger's symptoms. Initially cranial adjustments focused on the occiput, spinal adjustments to the upper cervical spine (C1 – C2), pelvis (Category II protocols) and thoracic regions (T3 and T7). Viscerosomatic reflexes relating to T3 and T7 were balanced utilizing chiropractic manipulative reflex technique (CMRT).

By the second month the patient was treated as a category one (sacroiliac joint fixation, pelvic torsion, and altered sacral nutation) and the cranial imbalance began to resolve. His office visits were reduced from every 3-5 days to every 7-10 days until May 2001, and following that time was shifted to be seen every two weeks.

Asperger's Syndrome symptoms "settled down within the first week of care.

Eithin 6 months his Asperger's symptoms had been stabilizing and he was off medications for asthma and allergies.

Presently the patient is 15 years old and has not needed any medication during the past 7 years, nor have his Asperger's symptoms returned. At the present time this patient is being seen on a wellness/maintenance chiropractic care program. There have not been any significant flare-ups of his Asperger's, asthma or allergies.

Post 2019 Research . . .



Case Study

Improved Behavioral Changes, Dysautonomia, Dysponesis and Quality of Life in an Adult with Autism Following Chiropractic Care to Correct Vertebral Subluxation: A Case Study & Review of the Literature

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2. *Private Practice of Chiropractic, Freeport, FL*

Abstract

Objective: The purpose of this study is to report on the positive health outcomes following chiropractic in an adult with Autism Spectrum Disorder.

Clinical Features: A 22-year-old female with Autism Spectrum Disorder and experiencing anxiety, nervousness, menstrual disorder, restriction of daily activities including personal interaction in social settings and speech came for chiropractic care to improve overall health and improve social behaviors. Examination revealed vertebral subluxations, dysponesis and dysautonomia.

Intervention and Outcomes: The patient was adjusted utilizing Torque Release Technique (TRT) to correct vertebral subluxations. Thermography and surface electromyography were utilized to assess the neurological component of vertebral subluxation. The Autism Treatment Evaluation Checklist was used to determine improvement in social outcomes for the patient. Following eight sessions of TRT the patient experienced reduction in dysautonomia and dysponesis along with improved speech, reduction in rigid routines and improved sociability.

Conclusion: The patient in this study experienced improved health outcomes related to autism following chiropractic care. More research is needed in this population of patients.

Key Words: *Autism, Autism Spectrum Disorder, chiropractic, adjustment, spinal manipulation, Torque Release Technique, vertebral subluxation complex, subluxation, dysponesis, dysautonomia, limbic system, behavioral disorders*

Introduction

Autism Spectrum Disorder (ASD) is a life-long early developmental disorder that causes clinically significant impairment in social, occupational, or functional areas in the person's life that are not otherwise explained by intellectual disability or global developmental delay. There is a dyad of criteria that are concerned in the diagnosis of ASD. In the area of social communication, some examples include deficits in social-emotional interaction, reduced emotions, and poorly integrated verbal and non-verbal communication.

The second criteria exhibit restricted, repetitive behavior, interests or activities. Often examples of this include lining up toys, repetitive flapping of the hands, inflexible adherence to routines, rigid thinking patterns, fixated interests, and sensitivity to sensory imput.[1] The Global financial impact of autism is unknown[2], however the annual societal cost of the condition in the United states (US) and in the United Kingdom exceeds several billions.[3-4] In the US the Centers for Disease Control (CDC) reported that 1 in 68 children are classified as having ASD in 2014.[5]

The etiology of autism is still unknown, but it was previously thought that parenting and environmental factors were believed to be responsible for the stereotypical autistic

Asia-Pacific Chiropractic Journal

CASEREPORT

An Autistic Spectrum Disorder (ASD) Level 3 nonverbal 4 year old, with learning difficulties starts conversations in 4 weeks: A case report

Genevieve Dharamaraj

Narrative: This case report describes ASD Level 3 nonverbal boy undergoing a novel Melillo Method™ therapy and looking at retained primitive reflexes as a measure of developmental delay. Retained primitive reflexes are the most basic stage of motor development, and knowledge of this motor-language relationship could provide insights into nonverbal autism.

The main symptoms presented were delayed speech, sleeping issues, emotional regulation with behaviour, and sensory issues. Clinical examination revealed many retained primitive reflexes, with many postural reflexes still present as well as a deficiency in core stability, vestibulo-occular systems and cognition.

Intervention included a 12 program including the use of Photobiomodulation (low level laser), Rezzimax therapy (sensory motor input with vibration), Neurosage (digital therapy utilising color, sound and vibration), and coactivation with the use of coloured glasses (light) and essential oils to stimulate the olfactory system. This program is centre-based and aims to integrate sensory input and strengthen motor skills through regular frequency and duration of multimodal approach, as well as home-based exercises to integrate primitive reflexes.

In the 12 week period the subject became able to have meaningful conversations, decreased his aggressive meltdowns, had consistent eye contact and was more coordinated with crossing the midline. These are all skills not previously demonstrated, as stated by his mum and feedback from his other therapists, once they restarted care.

The changes seen in this child over 12 weeks are numerous, and the examination revealed a decrease in the strength with the Retained Primitive Reflexes. Retained Primitive Reflexes are the most basic stage of motor development and knowledge of this motor-language relationship could provide insights into non-verbal Autism.

Indexing Terms: Chiropractic; Functional Neurology; Autism Spectrum Disorder; Melillo Method™; adaptability; well-being; brain potential.

Introduction

CASE STUDY

Resolution of Chronic Headaches, Improved Sociability, Health & Physical Behavior in a Child with Autism, ADHD and Obsessive Compulsive Disorder Following Chiropractic Care to Reduce Vertebral Subluxation: A Case Report & Review of Literature

Laura L Stone, DC[1] & Joel Alcantara, DC[2]

Abstract

Objective: To describe the positive health outcomes in a child with headaches, autism, ADHD and OCD undergoing chiropractic care.

Clinical Features: A. 11-year-old male with autism presented for care with complaints of headaches concomitant with a medical diagnosis of Autism, Attention Deficit Hyperactivity Disorder and Obsessive Compulsive Disorder. His headaches affected his school attendance and sleep. Prescribed pain medication provided temporarily relief. The patient was determined to have subluxations at the left ilium (i.e., PI_1IN_5), the S_2 vertebrae (i.e., P-L sacrum), the T_8 vertebrae (i.e., PRS), the C_2 vertebrae (i.e., PRS), the C_1 vertebrae (i.e., AIRP) and the occiput (i.e., AS-RS-RA).

Intervention and Outcome: The patient was cared for with a combination of Gonstead and Thompson Techniques. The patient's headache symptoms improved as did his behavioral problems as measured by the Autism Treatment Evaluation Checklist for parents. His quality of life improved as measured by the PROMIS-25 parent proxy measure. The PROMIS-29 demonstrated compromised quality of life in the patient's father while the IPC-18 showed the patient's father as experiencing a positive interpersonal process with his son's healthcare.

Conclusion: This study provided supporting evidence on the benefits of chiropractic care in patients with ASD, document the burden of raising a child with ASD and parental satisfaction with their child's chiropractic care.

Keywords: *Chiropractic, vertebral subluxation, adjustment, headaches, autism, ADHD, obsessive compulsive*

Introduction

Characterized with limitations in social behaviors and communication, repetitive behaviors and stereotyped interests, autism spectrum disorders (ASD) are a group of neurodevelopmental conditions.[1] In the United States, according to the CDC's Autism and Developmental Disabilities Monitoring (ADDM) Network, it is estimated that 1 in 68 children are identified as autistic.[2] Globally, systematic reviews of prevalence estimates vary given differences in research design. Williams et al.[3] estimated global ASD prevalence of 20 per 10,000 while Baxter et al.[4] estimated prevalence of 7.6 per 1000 or one in 132 persons worldwide.

Given that no pharmacological treatment is effective or has been approved by the US Food and Drug Administration

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CASE STUDY

Improvement in a 3-Year-Old Boy with Autistic Spectrum Disorder Undergoing Chiropractic Care to Reduce Vertebral Subluxation: A Case Study & Review of Literature

Drew Rubin, DC, CCSP, DACCP[1] & Erin McKernan Scupham, DC[2]

Abstract

Objective: To review the positive health outcomes in a three-year-old child with Autism Spectrum Disorder undergoing chiropractic care.

Clinical Features: Bilateral hypertonicity of the cervical, thoracic, and lumbar regions to include the trapezius, erector spinae, levator scapulae, and rhomboid muscles, were found upon examination. A positive Babinski reflex was present on the patient bilaterally as well as poor eye accommodation. Vertebral subluxations were found upon examination. The patient presented with a clinical diagnosis of Autism Spectrum Disorder that resulted in delayed developmental milestones, inability to eat solid foods nor gain weight, limited vocabulary to only a few words, aversion to being touched, sleep deprivation, and constipation. Past history included a difficult pregnancy, labor, and delivery for the patient's mother.

Interventions and Outcomes: Bioenergetic Synchronization technique protocol and analysis and Diversified Webster Pediatric Adjusting Technique with sustained contact were administered each visit over a 2-month period. Patient's progress was monitored through pattern analysis of subluxations, leg length inequality, primitive reflex testing, and observational reports from the mother and father. The patient had significant improvements in sleep patterns, behavior, sensitivity to touch, expansion of vocabulary, constipation, and retained primitive reflexes following chiropractic adjustments. The patient has since continued chiropractic care.

Conclusions: The chiropractic care and positive health outcomes of a patient with Autism Spectrum Disorder is presented. Further research is encouraged to explore the role of chiropractic in this population.

Key Words: *Chiropractic, autism, Autism Spectrum Disorder, ASD, Bioenergetic Synchronization Technique, BEST, Diversified Webster Pediatric Technique, sustained contact, SC, subluxation, pediatric, adjustment*

Introduction

Beginning in early childhood, typically before the age of thirty months, Autism Spectrum Disorder (ASD) is defined by abnormal or impaired development of communication and interaction with others, as well as a marked limitation in interests and activities.[1] According to the most recent statistics researched by the Center for Disease Control, 2.24% or 1 in 45 children in 2014 were diagnosed with Autism Spectrum Disorder. This is a marked increase from 2011 to 2013 where 1.25%, or 1 in 80 children were diagnosed with ASD. Of the 1 in 45 children diagnosed with ASD, 75% were males, 59.9% were white non-Hispanic., and 22.9% were also diagnosed with another developmental disorder. [2] There are several accompanying non-specific problems reported in children diagnosed with ASD including sleeping disturbances, eating difficulties, behavioral issues including tantrums and self-aggression such as head banging, caregivers usually

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CASE STUDY

Improvement Following Chiropractic Care in a 7-Year-Old Diagnosed with Autistic Spectrum Disorder: A Case Report & Review of Literature

Drew Rubin, DC, CCSP, DACCP[1] & Anette Bergo, DC[2]

Abstract

Objective: To describe the positive health outcomes following chiropractic care experienced by a seven-year-old boy with autism.

Clinical Features: A seven-year-old boy presents to a chiropractic clinic with chief complaints of stimming, poor social skills, lack of comprehension, and decreased executive function. He was diagnosed as autistic at the age of three years and nine months.

Intervention and Outcomes: The patient received chiropractic care, starting off with very gentle techniques such as sustained contact and Bio Energetic Synchronization Technique (B.E.S.T.), proceeding with Activator Methods, Network Spinal Analysis and cranial adjustments. Exercises to inhibit persistent primitive reflexes were given for the patient to do at home. The mother reported improvement of the autistic behavior after less than three months of chiropractic care.

Conclusion: This case study demonstrates the relationship between chiropractic care and decrease in autistic symptoms. Although multiple case and clinical studies show positive outcomes between chiropractic care and autism, further research should be conducted.

Keywords: *Chiropractic, vertebral subluxation, autism, Autism Spectrum Disorder (ASD), primitive reflexes, Network Spinal Analysis, Activator Methods, sustained contact, Bio Energetic Synchronization Technique (B.E.S.T.), cranial adjustment, spinal manipulation*

Introduction

Autism is part of Autism Spectrum Disorder (ASD) and is characterized as a behavioral disorder with impairments in communication, social skills, and often includes repetitive behaviors and manners.[1] Early detection and treatment of autism is important, and has been shown to decrease the severity of autistic symptoms and improve developmental functioning. Most research shows that behavioral signs are evident at the age of two years, although recent studies conclude that it is possible to see signs early in infancy.[2] Impaired or delayed motor functioning can be detected before social or linguistic abnormalities.[3]

Prevalence

The prevalence of autism is increasing, and a study from New Jersey compared the autistic rates in 2002 with 2006 and saw a significant increase.[4] It is unknown why the diagnosis of autism

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CASE STUDY

Reduction in Autistic Behavior & Improvement in Language Development, Sleeping, Constipation, and Ear Infections in a 17-Year-Old Male Following Chiropractic Care: A Case Study

Russell D. Herring, DC[1] & Jared L. Marcell, DC[2]

Abstract

Objective: To describe the positive health outcomes and improved quality of life following chiropractic care in a 17-year-old male with autism.

Clinical Features: A 17-year-old male presents for chiropractic care with autism, altered behavioral patterns, language deficits, sleeping problems, constipation, and earaches.

Intervention and Outcomes: Over a 24-month period specific chiropractic care to reduce vertebral subluxation was administered to the patient. Both the Activator Method Chiropractic Technique and the Torque Release Technique protocol were utilized in this case. The patient responded favorably to chiropractic care with patient demonstrating a decrease in frequency of earaches, normalized sleep patterns, improved language development, behavioral patterns, and digestion.

Conclusion: The improvement in autism related signs and symptoms are described in this case. Other studies have previously been conducted showing similar outcomes. More research is recommended to further explore the role of chiropractic in this population.

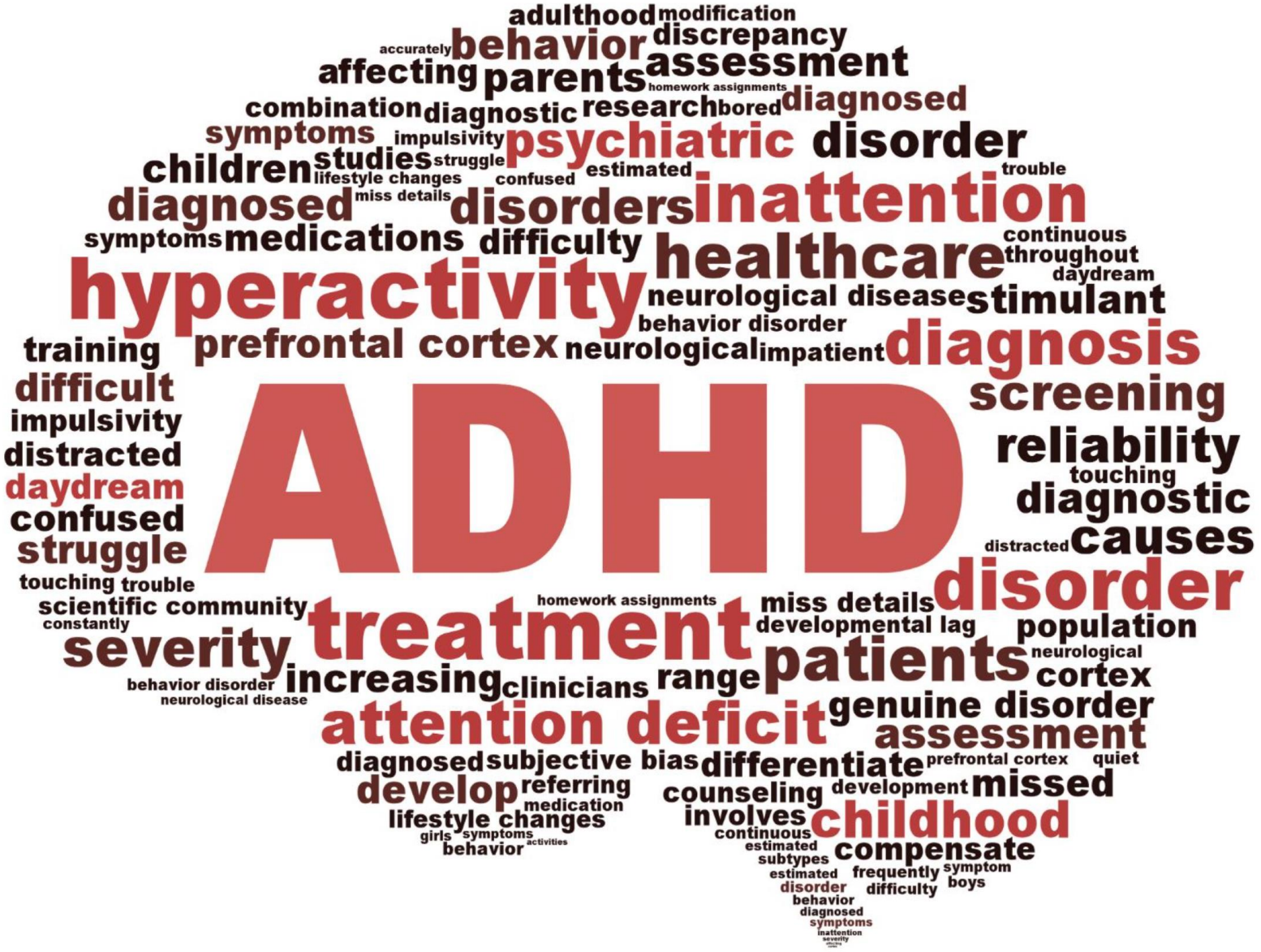
Key Words: *Chiropractic, autism, Torque Release Technique, Activator Adjusting Instrument, vertebral subluxation, adjustment, spinal manipulation, sleep disorder, neurodevelopmental disorders, constipation, otitis media*

Introduction

Autism can be defined as a disorder beginning in childhood marked by the presence of abnormal or impaired development in social interaction and communication with a markedly restricted repertoire of activity and interest.[1] The prevalence of autism has been quickly on the rise. In 1991-1992 the number of children in the United States with autism was 5,315 and in 2001-2002 the number was 97,847.[2] According to the Center for Disease Control and Prevention the rate in 2010 was 1 in 68 children.[3] A lot of people have attempted to identify the cause of autism, but there is no consensus to date.[4] The most accepted theories around the etiology of autism is genetic, environmental and hereditary.[5,6]

Social impairments can arise at a very early age with autistic children. In infants this can be seen as a diminished response to social stimuli, such as, responding to their name, reduced smiling and reduced eye contact. In toddlers the impaired development could express itself as non-responsiveness, lack of emotions, along with difficulty spontaneously approaching others.[7] Insufficiency in speech and communication is commonly present in autistic children as well. They exhibit poor nonverbal communication, a limited vocabulary, and smaller word combinations.[8] A range of other nonspecific problems are common, such as phobias, sleeping and eating disturbances, temper tantrums, and self-directed aggression.[9]

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adulthood
modification
accurately
behavior
discrepancy
affecting
parents
assessment
homework assignments
combination
diagnostic
research
bored
diagnosed
symptoms
impulsivity
psychiatric
disorder
children
studies
struggle
lifestyle changes
confused
estimated
trouble
diagnosed
miss details
disorders
inattention
symptoms
medications
difficulty
healthcare
continuous
throughout
daydream
hyperactivity
neurological diseases
stimulant
behavior disorder
training
prefrontal cortex
neurological
impatient
diagnosis
difficult
ADHD
screening
impulsivity
distracted
reliability
daydream
touching
confused
diagnostic
struggle
distracted
causes
touching
trouble
disorder
scientific community
homework assignments
miss details
constantly
developmental lag
population
severity
treatment
patients
neurological
behavior disorder
neurological disease
increasing
clinicians
range
cortex
attention deficit
genuine disorder
assessment
diagnosed
subjective bias
differentiate
prefrontal cortex
quiet
develop
referring
development
missed
counseling
medication
lifestyle changes
involves
childhood
girls
symptoms
activities
continuous
behavior
estimated
compensate
subtypes
estimated
frequently
symptom
disorder
difficulty
boys
behavior
diagnosed
symptoms
inattention
severity

ADHD

Experts now consider Attention Deficit Hyperactivity Disorder (ADHD) to be the most commonly encountered neurobehavioral disorder of childhood.

Among the most prevalent chronic health conditions developing in childhood, ADHD may persist over the entire life span.

1. Homer C, Baltz R, Hickson G, Miles P, Newman T, Shook J. Clinical practice guideline: diagnosis and evaluation of the child with attention-deficit/hyperactivity disorder. American Academy of Pediatrics. Pediatr 2000;105 (5): 1158-70

2. Brown R, Freeman W, Perrin J, Stein M, Amler R, Feldman H, et al. Prevalence and assessment of attentiondeficit/hyperactivity disorder in primary care settings. Pediatr 2001;107(3):E43

Ritalin

According to the United Nations, the United States produces and consumes 85 percent of the world's methylphenidate.

The average per capita use of methylphenidate across the United State was 3,082 grams per 100,000 population; for amphetamine it was 1,060 per 100,000.5 (See Graph 3 and Table 1)

ADHD



According to the Drug Enforcement Agency (DEA), methylphenidate prescriptions rose dramatically in the 1990's and are now at about 11 million per year. Amphetamine prescriptions such as Adderall, have increased recently, from 1.3 million in 1996 to close to 6 million in 1999.

According to the DEA the vast majority of prescriptions for amphetamine and methylphenidate are for children diagnosed with ADHD.

(See Graph 1)

Top 5 U.S. States – UN Report

Table 1

The top five ranking states in 1999 for methylphenidate and amphetamine use in grams per 100,000 population:

- New Hampshire (5,525)
- Vermont (5,005)
- Michigan (4,848)
- Iowa (4,638)
- Delaware (4,439)

The lowest ranking states for use of methylphenidate: were

- California (1,748)
- Hawaii (1,208)

For amphetamine, the lowest ranking were:

- New York (509)
- Hawaii (305)

ADHD - Increased Risks

Attention deficient/hyperactivity disorder clearly impacts today's youth. Children with ADHD also have an increased risk of developing conduct disorder, antisocial behavior, and drug abuse later in life.

ADHD is also associated with a twofold-increased risk of burns, fractures, head trauma, and poisoning. This increase is linked mostly to children on stimulant drugs for the treatment of ADHD.

Braun J, Kahn R, Froehlich T, Auinger P, Lanphear BP. Exposures to environmental toxicants and attention deficit hyperactivity disorder in U.S. children. Environ Health Perspect 2006;114(12):1904-9

Marcus S, Wan G, Zhang H, Olfson M. Injury Among Stimulant-Treated Youth With ADHD. J Atten Disord 2007;12 [Epub ahead of print]

Quality of Life

A study investigated health related quality of life (HRQL) in children with ADHD.

Of the children involved in the study, almost half took some type of stimulant medication and all these children were found to have significantly low Health Related Quality of Life.

Klassen A, Miller A, Fine S. Health-related quality of life in children and adolescents who have a diagnosis of attention-deficit/hyperactivity disorder. Pediatr 2004;114(5)

Alternative Tx Use

Parental concerns that drug therapy may not be in their children's best interests are one reason alternative treatments for ADHD are utilized in up to 64% of cases.

Bussing R, Zima B, Gary F, Garvan C. Use of complementary and alternative medicine for symptoms of attention-deficit hyperactivity disorder. Psychiatr Serv 2002;53(9):1096-102

Stubberfield T, Parry T. Utilization of alternative therapies in attention-deficit hyperactivity disorder. J Paediatr Child Health 1999;35(5):450-3

Alternative Treatments

According to recent research, patients with ADHD are using many types of alternative treatments. In one study of 822 children, Bussing reported that 5% (44 children) used complementary care including homeopathy, massage, chiropractic and acupuncture in the treatment of their ADHD.

14 children, or 1.7% used chiropractic care as an alternative.

Another study by Stubberfield involving 381 children showed 64% of patients utilizing alternative treatments that included exercise and diet.

Bussing R, Zima B, Gary F, Garvan C. Use of complementary and alternative medicine for symptoms of attention-deficit hyperactivity disorder. Psychiatr Serv 2002;53(9):1096-102

Stubberfield T, Parry T. Utilization of alternative therapies in attention-deficit hyperactivity disorder. J Paediatr Child Health 1999;35(5):450-3

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An Evaluation of Chiropractic Manipulation as a Treatment of Hyperactivity in Children

J. MARTIN GIESEN, Ph.D.,* DAVID B. CENTER, Ph.D.,† AND ROBERT A. LEACH, D.C.‡

ABSTRACT

The principle aim of this study was to determine the effectiveness of chiropractic manipulative therapy in the treatment of children with hyperactivity. Using blinds between investigators and a single subject research design, the investigators evaluated the effectiveness of the treatment for reducing activity levels of hyperactive children. Data collection included independent evaluations of behavior using a unique wristwatch type device to mechanically measure activity while the children completed tasks simulating schoolwork. Further evaluations included electrodermal tests to measure autonomic nervous system activity. Chiropractic clinical evaluations to measure improvement in spinal biomechanics were also completed. Placebo care was given prior to chiropractic intervention. Data were analyzed visually and using nonparametric statistical methods. Five of seven children showed improvement in mean behavioral scores from placebo care to treatment. Four of seven showed improvement in arousal levels, and the improvement in the group as a whole was highly significant ($p = 0.009$). Agreement between tests was also high in this study. For all seven children, three of the four principal tests used to detect improvement were in agreement either positively or negatively (parent ratings of activity, motion recorder scores, electrodermal measures, and X-rays of spinal distortions). While the behavioral improvement taken alone can only be considered suggestive, the strong intertest agreement can be taken as more impressive evidence that the majority of the children in this study did, in fact, improve under specific chiropractic care. The results of this study, then, are not conclusive, however, they do suggest that chiropractic manipulation has the potential to become an important nondrug intervention for children with hyperactivity. Further investigation in this area is certainly warranted. (J Manipulative Physiol Ther 1989; 12:353–363).

Key Indexing Terms: Chiropractic, Motor Activity, Galvanic Skin Response.

INTRODUCTION

Hyperactivity is a significant problem (1–3) in children with behavior and learning disorders. The major approach to treatment for this disorder has been treatment with stimulant medication (4). One alternative to drug treatment that has been investigated is behavior therapy (5).

For years, the fact that stimulant medication had an apparent calming effect on hyperactive children was referred to as a "paradoxical effect." In a study by Satterfield and Dawson (6) a hypothesis was formulated to explain the so-called paradoxical effect. The explanation offered by Satterfield and Dawson, based on data resulting from their study, was that in those cases having a positive response to stimulant medication, the hyperactivity was due not to over-arousal, as would be logically expected, but under-arousal. Specifically, these researchers hypothesized that reticular activating system-mediated central nervous system (CNS) arousal was below normal in their subjects. Thus, they argued that hyperactivity was the result of attempts by their subjects to increase arousal level through extraneous motor activity. When administered a stimulant drug, the arousal level was chemically increased thereby reducing the need to increase arousal level through motor

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Submit reprint requests to: Dr. Robert A. Leach, P.O. Box 1313, Starkville, MS 39759.

Paper submitted March 8, 1988.

Chiropractic Research

Seven hyperactive children who exhibited evidence of vertebral subluxation and found that five of the seven children showed improvement in mean behavioral scores from placebo care to treatment.

The authors stated that there was “impressive evidence” that the majority of children in their study improved under specific chiropractic care and they suggest that chiropractic has the potential to become an important non-drug intervention for hyperactive children.

Geisen J, Center D, Leach R. An evaluation of chiropractic manipulation as a treatment of hyperactivity in children. J Manipulative Physiol Ther Vol. 12, No. 5. October 1989.

J Manual Medicine (1992) 6:151–156

Journal of Manual Medicine
© Springer-Verlag 1992

Kinematic imbalances due to suboccipital strain in newborns

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Summary. Using case histories and catamneses, the pathogenetic potential of the craniovertebral junction in newborn and young children is discussed. Supporting neurophysiological findings are presented. The symptom complex of "kinematic imbalances due to suboccipital strain" (KISS syndrome) has a wide range of clinical signs and can in many cases be dealt with effectively by manual therapy. The main symptoms are torticollis, unilateral microsomy, C-scoliosis and motoric asymmetries, often accompanied by unilaterally retarded maturation of the hip joints and slowed motor development. Risk factors seem to be: intrauterine misalignment, application of extraction aids, prolonged labor and mulitple fetuses.

Key words: Manual therapy – Craniovertebral junction – Cervical spine – C-scoliosis – Motor asymmetry – Torticollis

The pathogenetic importance of asymmetric posture and motion in small children is often played down if recognized at all. Quite regularly, parents complaining about the bent position of their baby get the advice "to cantilever the baby during sleep, and it will go away"; this proves to be wrong in many cases. Vojta and Bobath went beyond the mere diagnostic description of "C-scoliosis" or "torticollis" and developed treatment schemes based on refined methods of examination and a deeper understanding of neuromotor development. These forms of therapy were developed for children with minimal cerebral damage (MCD) and greatly improved the changes of rehabilitation in these little patients. Both methods require a lot of discipline from parents and physiotherapists alike. In many cases the duration of the treatment can be shortened by combining and/or replacing it with manual therapy of the suboccipital segments of the upper cervical spine.

Patients and methods

Patients

Of the more than 600 children (age ≤24 months) treated to date, we chose a group of 135 babies referred to us by a pediatric orthopedist between 1981 and 1990; 114 of them could be reached for follow-up.

Most of the babies were refered to us because of asymmetric posture. The case histories included the following (Table 1):

- Tilt posture of the head, torticollis.
- Opisthotonos, head held in retroflexion. Unable to lie on the back, as this forces the head into anteflexion.
- Uniform sleeping posture; the child cries if the mother tries to change its position.
- Asymmetric motor patterns.
- Asymmetric posture of trunk and extremities, sometimes combined with a tilted head position reminiscent of a persisting asymmetric tonic neck reflex.
- Sleeping disorders; the baby wakes up crying every hour.
- Extreme sensitivity of the neck.
- Cranial scoliosis, swelling of one side of the facial soft tissues.
- Blockages of the iliosacral points, asymmetries of the gluteis muscles.
- Asymmetric development and range of movement of the hips.
- Fever of unknown origin; loss of appetite and other symptoms of central nervous system disorders.

Needless to say, these symptoms cover a wide range of pathological conditions and cannot always be attributed to the suboccipital joints, but if we encounter a combination of motor asymmetries, sleeping disorders and a facial scoliosis, it is worthwile to look at the suboccipital joints.

Table 1. Findings at first examination

	KISS
Mobility of the cervial spine reduced more than 30%[a]	85 (74.6%)
Torticollis	44 (38.6%)
C-scoliosis	40 (35.1%)
Unilateral microsomy	47 (41.2%)
Retarded development of the hip joints (sonographically verified)	50 (43.9%)
Opisthotonos	11 (9.7%)
Mobility of the vertebral spine reduced more than 30%	12 (10.5%)
Feet deformities	12 (10.5%)
Pathological reflexes[b]	3.2 of 7

[a] Including cases of torticollis
[b] Tested: Vojta, traction test; Peiper, Collis, vertical and horizontal; Landau, axiallary hanging test (see [37])

600 children less than two years old.

"suboccipital strain"

This area can literally be a **chokepoint.**

Biedermann found the infants and children effected by these subluxations in the neck experienced **birth trauma, prolonged labor and the use of things like forceps** during their births

Number one thing that brought these infants into Biedermann's clinic: **Asymmetric posture**.

Tilted head, the head held backwards, awkward sleeping positions, movements on one side of the body that don't match the other side, sleeping disorders, extreme sensitivity, swelling of one side of the face, abnormalities of the hips and spine, unexplained fevers, loss of appetite.

Biedermann found that their necks were stiff, had reduced range of motion, one side of the head sometimes larger than the other, abnormal reflexes, muscle spasms of the back so severe that the infants' backs were arched

Biedermann **took x-rays** which he used to help determine how to fix the misalignments

Blocked Atlantal Nerve Syndrome
In Infants and Small Children

BY G. GUTMANN

(Published in "Manuelle Medizin" © Springer-Verlag 1987. The "ICA Review" thanks the Barge Chiropractic Clinic of LaCrosse, Wisconsin, for having the original paper translated into English by Ronald M. Mazur, PhD; Winona State University, Minnesota. Translation published with permission of "Manuelle Medizen" publishers.)

Summary: Three case reports are reviewed to illustrate a syndrome that has so far received far too little attention, which is caused and perpetuated in infants and small children by blocked nerve impulses at the atlas. The clinical picture ranges from central motor impairment and development through idencephalic impairments of vegetative regulatory systems to lowered resistance to infections, especially to ear-, nose- and throat-infections. The theoretical background to this syndrome is indicated. The main factor in the causation concerns the neurophysiological connections between the area of the atlanto-occipital joint and centers in the brain stem. In addition to the case history (birth trauma, etc.) and the pediatrician's diagnosis, chiropractical and radiological examination are of decisive importance for the diagnosis of this syndrome. If the indications are correctly observed, chiropractic can often bring about amazingly successful results, because the therapy is a causal one.

Key words: Babies, infants, atlas, blocked nerves, dysregulation, motor, vegetative, impaired development, resistance lowered to infections, diagnosis and therapy, chiropractical.

REPRINTED BY PERMISSION OF THE "ICA REVIEW" AND DR. FRED BARGE.

We described this syndrome for the first time in 1953, and then again in 1968, with the complex designation, cervical-diencephalic-static syndrome (C.D.S.). In 1984 we described it as cervical-diencephalic-kinesiological syndrome in small children.

Even though it is among the most satisfying indications of the effectiveness of manual therapy, evidently even experts in our own ranks have hardly gained access to this occurrence at all. Only the pediatrician Mohr (30) has checked our reports and confirmed them in full measure. Lewit, (26, 27) and later Seifert (35) expressed a similar opinion in the German Democratic Republic.

CASE STUDIES

V.S., 10-month-old male child
Congenital torticollis after suction-belljar delivery. Post-natal haemotoma of the sternocleidic mastoid on the right side.

In spite of intensive therapeutic gymnastics, no improvement in the torticollis. A clear-cut asymmetry had developed in the skull and face. Crawling, let alone sitting, was impossible. The orthopedic institute treating the patient diagnosed cerebral disturbances of movement.

Our X-ray findings: Moderate degree of inferior location of the atlas with kyphotic position of the HWS and dislocation of the occiput (al) on the right side across from Cl and C2.

No clear blockage could be felt manually. Targeted manual impulse treatment (Cl/C2 from the left with counter-support of the occiput (al).) In the course of the next 12 months, the first clear improvement in posture and motor responses, confirmed by colleagues collaborating in the treatment.

The second treatment was after 4 months. The parents reported that the child had literally made a great leap forward after each treatment.

Later reports from the parents and treating doctors confirmed unanimously that both motor responses and the previously retarded mental and linguistic development were now pro-

Blocked Atlantal Nerve Syndrome

Gutmann found that these infants suffered from lowered resistance to infections, especially to ear-nose- and throat infections, insomnia, cranial bone asymmetry, torticollis, walking problems, language delays, conjunctivitis, tonsillitis, rhinitis, earaches, extreme neck sensitivity, scoliosis, delayed hip development, and seizures.

The causation according to his report lay in the neurophysiological connections between the upper cervical spine and the brainstem

Case Reports

Previous case reports on chiropractic, ADHD and other neurobehavioral disorders all show improvement of symptoms with such care.

Barnes reports on an 11 year old boy with medically diagnosed attention deficit hyperactivity disorder who experienced academic and behavioral improvements concomitant with reduced subluxations following the introduction of chiropractic, nutritional, visual and counseling therapy.

Barnes T. A multifaceted approach to Attention deficit Hyperactivity Disorder: A Case report. The International Review of Chiropractic. January/February 1995.

Case Reports



Phillips reports on a 10 year old boy with a chronic history of ADHD, otitis media, allergies and headaches. The child had a history of birth trauma, forceps delivery and plagiocephaly.

The boy reportedly cried for over 3 months following birth and was diagnosed with colic. The child received diversified spinal adjustments and craniosacral therapy for 5 months with improvement in symptomatology beginning at the end of the 4th visit. By the 11th visit all reports of ADHD symptoms had abated and academic improvement in school was noted.

Phillips C. The effect of utilizing spinal manipulation and craniosacral therapy as the treatment approach for attention deficit hyperacticvity disorder. Northwestern College of Chiropractic.

CASE STUDY

Behavioral and Learning Changes Secondary to Chiropractic Care to Reduce Subluxations in a Child with Attention Deficit Hyperactivity Disorder: A Case Study

Lisa Lovett DC†, Charles L. Blum, DC‡

ABSTRACT

Objective: Attention Deficit Hyperactivity Disorder (ADHD) is extremely subjective in both diagnosis and treatment. No single cause has yet been determined for this disorder nor has there been a single treatment plan that is effective in a majority of cases. This paper proposes a possible etiology for some cases of ADHD with respect to concentration and hyperactivity along with a possible positive association with chiropractic adjustments.

Clinical Features: A case history is presented of an 8-year-old child with many learning and behavioral disorders that are associated with ADHD and temporally related to a fall incurred 18 months prior to being seen at this office. Physical examination revealed limited cervical ranges of motion, radiological examination noted a cervical base angle of 23 degrees, and sacro occipital technique examination had findings consistent with a sacroiliac hypermobility syndrome (category 2).

Intervention and Outcome: For the first two months of care the patient was seen once a week with every adjustment consisting of SOT pelvic blocking procedures and cervical adjustments. While prior to care the child's symptoms had been stable for 18 months, following two months of care his mother noted positive changes in behavior and reduction in his complaints of headaches and neck pain symptoms. During the two month period of treatment, reports from his teachers at school remarked on the positive changes in his behavior and improvements in academic performance.

Conclusion: There are many causes to ADHD as well as other learning and behavioral disorders; therefore conclusions cannot be conclusively drawn by a single case study. A possible conclusion that can be drawn in this case is that adjusting spinal lesions (e.g., subluxations) appeared to reduce the child's pain and discomfort, which allowed him the ability to concentrate, learn and "sit still." Further studies with controls need to be conducted in this area to determine the effectiveness of chiropractic care in aiding the symptoms of children who are classified as ADHD.

Key Words: ADD, ADHD, sacro occipital technique, SOT, Chiropractic, craniosacral, dural function, CSF flow, behavioral disturbances, learning disabilities, subluxation.

Introduction

Anecdotal stories of patients entering chiropractic clinics for vertebrogenic symptoms and finding pain relief as well as relief from seemingly unrelated problems is commonly accepted. There is research from the 1920's by Winsor who linked diseased organs and spinal deformities and aberrant spinal function.[1] This work was continued by Schmorl, Korr, Sunderland, Lewitt and others investigating the pathways and consequences of spinal dysfunction on organ function and in some cases the

head injury.[11-14] Postconcussion Syndrome can produce behavioral changes in the form of anxiety, apathy and depression. [15-20]

Anyone who has had a headache knows that a headache affect's one's ability to concentrate. Headache sufferers are more likely to suffer from a psychological disturbance such as depression and anxiety, and psychological disturbances often carry with it symptoms of a headache.[21-22]

With children who are learning disabled and/or classified as Attention Deficit Hyperactivity Disorder (ADHD), it is impor-

The patient presented with headaches, neck pain, constant blood shot eyes, and ADHD like symptoms.

Notably, all of these symptoms started after a fall 18 months previous. The patient's mother indicated that prior to the fall, the child had normal development, activity, and learning skills.

Three spelling tests were also included in the report; one from before the care began and two from after. The improvement in writing and spelling demonstrate improvement of the patient's learning skills and visual motor tasks.

CASE STUDY

Improvement in Quality of Life, Sleep & Attention in a Patient with Attention Deficit Disorder Undergoing Upper Cervical Chiropractic Care to Reduce Vertebral Subluxation: A Case Report

Marshall Dickholtz Sr., D.C & Evan White, D.C.

ABSTRACT

Objective: To report an improvement in quality of life, sleep and attention following reduction of an upper cervical vertebral subluxation in a patient with Attention Deficit Disorder.

Clinical Features: A 19-year-old male presented for chiropractic care with complaints of Attention Deficit Disorder and chronic dorsal and lumbar pain.

Intervention and Outcomes: National Upper Cervical Chiropractic Association (NUCCA) technique was utilized to evaluate the appropriateness of chiropractic care. Several objective clinical findings were noted. The atlas misalignment was corrected with an upper cervical adjustment and immediate improvement was observed. Visual evoked responses revealed normalization of a previously abnormal steady-state visual evoked response. Outcome assessment tools showed significant improvements in overall health.

Conclusion: The reduction of the upper cervical vertebral subluxation was concomitant with improved quality of life, sleep and visual evoked responses.

Key Words: *Attention Deficit Disorder (ADD), Attention Deficit Hyperactivity Disorder (AD/HD), adjustment, subluxation, Magnetoencephalography (MEG), National Upper Cervical Chiropractic Association (NUCCA), Dysafferentation, Atlas*

Introduction

The Diagnostic and Statistical Manual of Mental Disorders defines three types of Attention Deficit Disorder (ADD): 1. Inattentive type; 2. Hyperactive-Impulsive type; and 3. Combined type (Inattentive and Hyperactive-Impulsive).[1] In order to be formally diagnosed an individual must display at least six symptoms specific to the first two types listed above. To be diagnosed as combined type an individual must display at least six symptoms from both the first and second type.

According to Barry et al, Attention Deficit Hyperactivity Disorder (AD/HD) "refers to a variable cluster of hyperactivity, impulsivity, and inattention symptoms which substantially affects the individual's normal cognitive and behavioral function."[2] AD/HD or something similar was first described by the ancient Greeks.[3] The first formal definition of the condition was established by Still in 1902.[3]

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Case Study

An Epidemiological Approach to the Effects of Subluxation-Based Chiropractic Care on the Management of ADHD, Depression and Learning Disabilities in an 8-Year Old: A Case Study

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1. *Student - Life University, College of Chiropractic & Emory University School of Public Health, Atlanta, GA*
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Abstract

Objective: To present the findings in which an eight-year boy diagnosed with ADHD and learning disability experienced marked improvement in response to subluxation-based chiropractic management.

Clinical Features: Eight-year male presented into the office with a chief complaint of ADHD (inattentive type) and learning disability regarding working memory and processing speed. Seven months prior he was diagnosed via private psycho-educational testing validating these conditions. The patient's mother brought him into for chiropractic care for an alternative treatment plan to managing these concerns. His mother reported that his medications appeared to be ineffective, causing nausea, heart palpitations and low appetite.

Intervention and Outcomes: Subluxation-based chiropractic was initiated utilizing Chiropractic Biophysics (CBP) and Turner Cranial techniques, which resulted in significant improvements in the following areas: irritability, mood swings, social interaction, temper, energy, memory and immune function. After eight months of care he continues to progress as evidenced by positive reports from his school teachers and parents.

Conclusions: The improved outcomes of a child with ADHD, learning disability, and social behavior disturbance undergoing chiropractic management to reduce vertebral subluxation are described. We suggest that clinical trials formally testing the efficacy of these findings in a controlled setting be conducted to confirm whether or not chiropractic care should be part of the multidisciplinary management of these conditions.

Key Words: *chiropractic, subluxation, adjustment, CBP, ADHD, learning disability, SHINE*

Introduction

It is through the lens of epidemiology that we approach the case of an eight-year old boy who experienced significant improvement as a chiropractic patient with attention deficit hyperactivity disorder (ADHD). Evaluating the wide-spectrum of factors relating to a disorder as complicated as ADHD in this way not only lends itself to providing thorough explanations to the proposed mechanisms of this phenomenon, it sets up the framework for a better understanding of the condition itself and the variety of ways chiropractors can modify their care plans accordingly. In our opinion, any other strategy would be a disservice to the profound effect subluxation-based chiropractic care has on health concerns such as described in this case study.

Epidemiological Approach

One of the more broadly accepted definitions of epidemiology describes this public health initiative as, "The study of the

ORIGINAL RESEARCH

Improvement in Attention in Patients Undergoing Network Spinal Analysis: A Case Series Using Objective Measures of Attention

Yannick Pauli D.C.[1]

ABSTRACT

Objective – Anecdotal preliminary evidence suggests that chiropractic care may be of benefits for individuals suffering from ADHD. This case series presents the improvement in attention experienced by 9 adult patients undergoing Network Spinal Analysis.

Methods – Nine adult patients are presented (4 male, 5 female) with a mean age of 40.4 years (range 22 – 58 years old). All patients were evaluated with the Test of Variable of Attention (TOVA) before receiving Network Spinal Analyis (NSA) care and at 2 months into care. The nine patients received level 1 NSA care for two months, as taught by the Association for Network Care. Neurospinal integrity was evaluated with palpation, as well as surface electromyography. Cognitive process of attention was objectively evaluated using a continuous performance test, the Test of Variables of Attention (TOVA).

Results: We evaluated our patient cohort before and after Network care using sEMG and variables from the continuous performance test (TOVA). Before care, all patients had an abnormal ADHD score with a mean of -3.74 (range: - 8.54 to - 1.89). After 2 months of care, all patients had a significant change in ADHD score ($p=0.08$) and 88% completely normalized the ADHD score. 77% and 66% of patients experienced significant change in reaction time and variability score, respectively. All patients experienced a significant reduction in sEMG pattern of activation ($p=0.08$). We discuss possible mechanisms by which spinal care may have enhanced the function of the prefrontal cortex, thereby resulting in improved attentional capacities

Conclusion – In this case series the nine adult patients experienced significant improvement in attention, as measured by objective outcomes, after receiving two months of Network Spinal Analysis. The progress documented in this report suggests that NSA care may positively affect the brain by creating plastic changes in the prefrontal cortex and other cortical and subcortical areas serving as neural substrate for the cognitive process of attention. These findings may be of importance for individuals suffering from attention deficit. Further research into this area is greatly needed.

Key words: *chiropractic, attention, Network Spinal Analysis, thalamocortical oscillations, subluxation*

Introduction

Attention is the cognitive process of selectively concentrating on one thing, while ignoring other things.[1] In 1890, American psychologist and philosopher William James wrote:

"*Everyone knows what attention is. It is the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneous possible objects or train of thoughts. Focalisation, concentration, of consciousness are its essence.*"[2]

Despite this seemingly simple description, more than a century of research and the fact that attention is one of the most studied domains in psychology and neuroscience, a clear understanding and a uniformly accepted definition of the word are yet to emerge.[3] Attention has been defined in many ways and various subcategories have been created to further precise the concept [4] (see table 1). Gerschwind defined attention as the ability to maintain a coherent line of thought or action [5].

Despite those considerations, the nature of attention remains elusive. This is not surprising since attention is not a unitary faculty. Rather, it is a diversified faculty of the human cognitive system that is subserved by multiple interrelated attentional networks in the brain and manifests itself in a

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Nine adult patients complaining of attention issues who took the visual portion of the Test of Variables of Attention (TOVA). All patients showed improvement in their TOVA scores after undergoing Network chiropractic care.

CASE STUDY

Successful Care of a Young Female with ADD/ADHD & Vertebral Subluxation: A Case Study

Leslie Bedell, D.C.

ABSTRACT

Objective: This case is being presented to emphasize the important role that Chiropractors play in the treatment of children diagnosed with Attention Deficit Disorder.

Clinical Features: A mother brought her seven year-old daughter in for evaluation. Her primary concerns were the attention and focusing problems she was having in school, hyperactive behavior, sleep disturbances and her aggressive, negative behaviour toward her sister.

Intervention and outcome: Examination included postural assessment and the protocols of the Torque Release Chiropractic technique were employed to determine the location of vertebral subluxations. The mother filled out a behavioural and personality assessment as well as a general health history form. During the course of her chiropractic care, her mother completed a weekly monitor of the child's sleeping and appetite patterns as well as various behavioural traits, rating them on a 1-10 scale. The patient began receiving Chiropractic adjustments for the correction of her vertebral subluxations three times a week. She also received Craniosacral therapy in conjunction with her chiropractic adjustments.

The mother and child were instructed on dietary changes and nutritional supplements that would support neurological function. Resources were also given to the mother that taught visual and kinesthetic communication techniques.

Over the course of her 90-day treatment schedule, improvements were noted on the daughter's weekly behavioural assessments. The mother noticed an overall change in her attitude as well as specific tasks.

Conclusion: Up to six million children display symptoms and learning disabilities that are labeled as ADD/ADHD and are subsequently put on medications that have not been proven safe and effective, and also have serious side effects. Research shows that many of these children are pre-disposed to addictive and obsessive/compulsive disorders due to a genetic variant and that the medications can launch them into more dangerous behaviours and substance abuse.[1]

Family Chiropractors frequently see these children in their offices and are often able to correlate symptoms with the presence of vertebral subluxations and other factors that affect the child's quality of life, including diet, lifestyle, and emotional stressors. As chiropractors, the ultimate goal of care is to improve over-all function by reducing vertebral subluxations that interfere with life expression.

Key Words: *Chiropractic, Subluxation, Torque Release, adjustment, ADD/ADHD (Attention Deficit Disorder/ Attention Deficit Disorder with Hyperactivity)*

Introduction

There is much controversy surrounding the diagnosis of ADD/ADHD. The diagnostic criteria used in the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM) last revised in 1994 divides the condition into two types.

One is for "Inattention" and the other "Hyperactivity-impulsivity" behaviours. Dr Weintraub, shows these tables in her textbook, Natural Treatments for ADD and Hyperactivity.[2] Many of the symptoms listed apply to perfectly normal children:

Private Practice North Bend, Washington

Over the course of her 90-day treatment schedule, improvements were noted on the daughter's weekly behavioural assessments. The mother noticed an overall change in her attitude as well as specific tasks.

*Other interventions

CASE STUDY

Improvement in a Child with Attention Deficit Hyperactivity Disorder, Kyphotic Cervical Curve and Vertebral Subluxation Undergoing Chiropractic Care

Gerard Cassista DC.[1]

ABSTRACT

Objective: To report on the response of a child with attention deficit hyperactivity disorder (ADHD) using specific chiropractic spinal adjustments.

Clinical Features: A four-year old boy presented with a kyphotic cervical curve demonstrated by x-ray as well as an abnormal paraspinal surface electromyography (SEMG) and infra-red thermal scans. He had sleep disturbances and was diagnosed by his pediatrician with ADHD.

Intervention and Outcome: Specific chiropractic spinal adjustments were administered in each of 50 office visits over an eight month span. Care consisted of Pettibon negative Z, toggle recoil and Thompson techniques. There was a dramatic improvement in overall behavior, sleep times and patterns and marked improvement of SEMG, thermal scans and radiographs.

Conclusion: Conservative specific chiropractic spinal adjustments were found to be a safe and effective alternative form of care to for this child with ADHD.

Key Words: *Attention deficit hyperactivity disorder (ADHD), ADD, asthma, chiropractic, spinal adjustments, SEMG, thermography, Pettibon technique, Thompson technique, subluxation, toggle recoil.*

Introduction

Attention deficit hyperactivity disorder is a condition defined as "a persistent pattern of inattention and/or hyperactivity and impulsivity that is more frequent and severe than is typically observed in individuals at a comparable level of development" (DSM -IV).[1] Prevalence estimates among school children range from 3 to 5 percent but other estimates vary from 1.7 to as high as 16 percent.[2] Typical allopathic treatment has been prescribed use of strong psycho stimulants in the methylphenidate family. This treatment has been the focus of great controversy due to the severity of some of the side effects of these drugs, particularly when prescribed at early ages. Significant side effects include a decrease in annual growth rates and decrease in annual weight gain rates.[3] Many parents and adults concerned with these side effects seek alternative care for remediation of symptoms. Change of diet,[4-6] vitamins and minerals,[7] aromatherapy,[8] biofeedback,[9] exercise therapy[10] and chiropractic care are some examples of alternative therapy used most frequently.[11]

The use of chiropractic care as a viable protocol for decreasing the severity or leading to the remission of ADHD has been documented in the literature as having the highest level of effectiveness of 20 types of alternative care tested.[11] In this study, a sample was drawn from patients aged 5-17 years with ADHD attending Royal Children's Hospital, Melbourne outpatient clinics from May to September 2003. A 20 item survey was posted to consenting families. The results demonstrated that 50% of those who had tried chiropractic reported a favorable response, which received the highest rating. Modified diet was second with 42.4% reporting favorable results. It is the purpose of this paper to present a case of normalization of a child with diagnosed ADHD based on dramatic pre and post changes of objective testing along with concomitant subjective improvement in all areas of involvement. This paper will also serve to highlight the

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CASE STUDY

Improvement in a Child with Scoliosis, Migraines, Attention Deficit Disorder and Vertebral Subluxations Utilizing the Pierce Chiropractic Technique

Eric Jaszewski, D.C.[1], Antonietta Sorbara, D.C. [2]

Abstract

Objective: To review the effectiveness of the Pierce "Results System"™ of vertebral subluxation analysis and correction for a 7-year-old female patient diagnosed with idiopathic scoliosis, attention deficit disorder, and migraines.

Clinical Features: The patient is a 7-year-old female born with paralysis to the right side of the face from a difficult birth, and was issued a helmet to help reshape her head due to deformity. She also suffered from attention deficit disorder, difficulty concentrating, vomiting, and light sensitivity from intense migraine headaches since the age of 2. She had scoliosis with a Cobb angle measuring 13°.

Intervention and Outcomes: During the patient's initial examination, evidence of vertebral subluxations were identified using thermographic and radiographic assessments. All assessments and care were performed in accordance with the guidelines of the Pierce "Results System"™. Chiropractic care using a conservative, full spine technique was administered to correct and stabilize the vertebral subluxations. Along with improvement of subjective complaints, the post AP lumbopelvic radiograph showed a 62% improvement in Cobb angle after just one month of care.

Conclusions: The case of a seven year old female with past history of a difficult birth is presented. Dramatic improvement in the patient's scoliosis is noted following the introduction of chiropractic care concomitant with a reduction in vertebral subluxation. Further investigation is warranted to more clearly understand the effects of the Pierce "Results System"™ and chiropractic in children and on scoliosis, migraines, and attention deficit disorder.

Key Terms: *Pierce Results System, chiropractic, subluxation, idiopathic scoliosis, video fluoroscopy*

Introduction

Idiopathic scoliosis (IS) is defined as a lateral curvature of the spine greater than 10 degrees accompanied by vertebral rotation. It is present in 2-4% of children between 10 and 16 years of age.[1-5] Though more research is currently being done on the onset of idiopathic scoliosis in children, it is widely thought that biomechanical, neurological, and postural abnormalities are some of the leading causes of this affliction[1-5] Since chiropractic deals very intimately with these three areas, it is normal to postulate the possibility of scoliosis correction following normalization of aberrant biomechanics, posture, and neurology.[1-5] The Pierce "Results System"™ looks at all three of these issues carefully when deciding where, when, and how to administer chiropractic care to patients.[6,7]

Conservative treatment of IS has been to brace patients with up to a 40 degree Cobb angle. After 40 degrees, surgery is

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30% Improvement in ADHD

CASE STUDY

Improvement in a Child with Sensory Processing Disorder Following Subluxation Based Chiropractic Care & Dietary Changes

Jason T. Olafsson DC

Abstract

Objective: To describe and discuss the subjective and objective results of a 4½ year old patient with documented sensory processing disorder following dietary changes and chiropractic adjustments.

Clinical Features: A 4½ year old male child with learning disabilities, reduced social interaction, and increased sensory stimulation behaviors presented for chiropractic care. The patient was suspected to have attention deficit-hyperactivity disorder (ADHD) along with his diagnosis of sensory processing disorder one year prior.

Intervention and Outcomes: A full spine adjusting technique utilizing a hemispheric model was used to address vertebral subluxations. A gluten-free, refined sugar-free, and casein-free diet was advised and subsequently adopted at the beginning of care and exercises were given to stimulate the patient's sensory nerve pathways. The child experienced a decrease in outbursts, improved attention span, improved ability to focus and he began to read.

Conclusion: Improvement in neurodevelopment is noted by the practitioner and the parents of the patient following the introduction of chiropractic care, subsequent reduction of vertebral subluxation, and removal of gluten, casein, and refined sugar from his diet. These findings suggest a positive link between subluxation removal and diet therapy in sensory processing disorders. Additional research on SPD/ADHD/Autism and chiropractic is warranted.

Key words: *chiropractic care, sensory processing disorder, autism, aspergers, vertebral subluxation, hemispheric adjusting, gluten, casein, attention deficit-hyperactivity disorder, learning disabilities*

Introduction

Sensory processing disorders (SPD) are impairments in detecting, modulating, interpreting, or responding to sensory stimuli.[1-3] The prevalence of SPD is widely debated but a recent study gave a screening questionnaire to parents of children starting kindergarten in public schools and of the 703 participants, a conservative estimate suggested that 5.3% of the children met the criteria for a SPD.[1]

A SPD may present in many different ways. According to Ayres, she identified six areas of dysfunction for children with SPD. She referred to them as "syndromes". The six are; auditory language disorder, bilateral integration, developmental apraxia, form and space perception, tactile defensiveness, and unilateral disregard/right cerebral hemisphere dysfunction.[2]

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Case Reports



In the second study Bastecki reports on a patient with cervical kyphosis who underwent Chiropractic Biophysics technique.

The patient was a 5-year-old diagnosed with ADHD and treated by a pediatrician unsuccessfully with methylphenidate,
Adderall, and Haldol for three years.

The child received 35 chiropractic adjustments over an 8 week period. Cervical curve measurements revealed a change from a 12 degree C2-7 kyphosis to a 32 degree C2-7 lordosis following chiropractic treatment. The child's facial tics resolved and his behavior vastly improved with the child's pediatrician stating that the child no longer exhibited symptoms of ADHD.

Bastecki A, Harrison D, Haas J. Cervical kyphosis is a possible link to attention-deficit/hyperactivity disorder. J Manipulative Physiol Ther 2004;27(8):e14

Case Reports



One interesting case study looked at EEG patterns (brain mapping) before and after chiropractic adjustments.

A 15- year-old patient with ADHD and his family had found that upper cervical adjustments relieved his symptoms and they wanted some objective evidence to show his school administration. This patient also had a history of frequent falls as a child and adolescent. His EEG showed a lack of synchronization of alpha and theta frequencies, similar to the findings in the aforementioned study on EEG biofeedback and ADHD.

Immediately following the adjustment, his EEG patterns dramatically changed to resemble patterns which were closer to normal. Though his handwriting did not noticeably change, he was able to perform a written task with more speed and less hesitation. The examiners also noted that while speaking with his father and professionals regarding his EEG after the adjustment, his social communication, attention, and focus improved. Interestingly, EEG patterns change in similar ways after biofeedback therapy and chiropractic adjustments.

Hospers L. EEG and CEEG studies before and after upper cervical or SOT category II adjustment in children after head trauma, in epilepsy and in “hyperactivity”. Proceedings of the National Conference on Chiropr Pediatr 1992:84-138

Chiropractic Management of a Child with Attention Deficit Hyperactivity Disorder & Vertebral Subluxation: A Case Study

Pamela A. Stone-McCoy B.S., D.C., FICPA[1] & Lisa Przybysz B.S., D.C.[2]

Abstract

Objective: To investigate the chiropractic care of a child with ADHD and review the related literature.

Clinical Features: A 3 ½ year old male child diagnosed with attention deficit hyperactivity disorder and a history of birth trauma and ear infections presents with signs of vertebral subluxation.

Interventions and Outcomes: Vertebral subluxations were addressed using toggle recoil adjustments to reduce an Atlas subluxation. Dietary advice, supplements and proprioceptive exercises were given to the patient as part of the care plan. Patient's mother and teachers reported a decrease in hyperactivity and an increase in attention. Paraspinal thermal scans improved after one month of care.

Conclusion: While research on chiropractic care for children with ADHD is limited, some studies have shown improvement in these children while under such care. This is an important area in need of further study and should include the investigation of a combination of chiropractic, nutrition, exercise, and other CAM treatments.

Key Words: *Chiropractic, attention deficit hyperactivity disorder, ADHD, compulsive disorders, chiropractic, adjustment, subluxation, thermography, children, CAM, birth trauma*

Introduction

Experts now consider Attention Deficit/Hyperactivity Disorder (ADHD) to be the most commonly encountered neurobehavioral disorder of childhood. Among the most prevalent chronic health conditions developing in childhood, ADHD may persist over the entire life span.[1,2]

Diagnostic methods have been especially controversial in recent years as the perceived prevalence of the disease varies as the diagnostic criteria changes over time. Some studies show a 4%-12% prevalence rate among school-aged children with males being three times more likely to be diagnosed with ADHD than females.[1]

The health care system and parents have made a significant push for pediatric care providers to not only properly diagnosis ADHD but to manage it as well. Much of this push is due to the drastic increase in prescriptions for stimulant medications being given to school-aged children with an ADHD diagnosis over the past decade. The fear of over-diagnosing and over-prescribing these powerful medications has been a significant part of the reassessment of how the syndrome is diagnosed.[1,2]

Regardless of the controversy in diagnostic criteria, ADHD is clearly a problem for school-aged children with

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Post 2019 Research . . .



CASE STUDY

Resolution of Nocturnal Enuresis, Constipation, Headaches, Allergies & Cold Hands in a 6-Year-Old Male Following Chiropractic for Vertebral Subluxation: Case Study & Review of the Literature

Russell Herring, DC[1] & Danielle Wright, DC[2]

Abstract

Objective: To report on the positive health outcomes of a child with multiple co-morbidities undergoing chiropractic care.

Clinical Features: Parents presented a 6-year-old male with a history of nocturnal enuresis, headaches, ADHD, asthma, allergies, constipation, earaches, and cold hands. The patient had been prescribed and taking several different medications including over the counter pain relievers, laxatives, Qvar (beclomethasone dipropionate) inhaler, Nasonex, Albuterol, Benadryl, and Claritin. Clinical examinations performed by the chiropractor revealed signs of vertebral subluxation.

Intervention and Outcomes: A diversified chiropractic technique was applied combining motion and static palpation, pelvic protocols from Thompson Terminal Point Technique and implementation of the Activator and Integrator adjusting instruments. After twenty adjustments complete resolution of enuresis was reported. On the twenty-fifth visit, the patient's parents reported complete resolution of cold hands and constipation, as well as 80% relief of all remaining symptoms.

Conclusion: This study presents relief of nocturnal enuresis, headaches, ADHD, asthma, allergies constipation, earaches, and cold hands in a 6-year-old male following chiropractic adjustments. Further research is suggested to explore the value of chiropractic management of patients with nocturnal enuresis.

Key Words: *chiropractic, subluxation, nocturnal enuresis, adjustment, headaches, pediatric, constipation, ADHD, asthma, allergies*

Introduction

Nocturnal enuresis (NE) is a common condition occurring in up to 15% of seven year olds who show no symptoms during the day, but still void at night.[1] Research shows that NE is more common in boys than girls, and can commonly be associated with encopresis and behavioral disorders such as ADHD.[2] Even though chances of self-correction diminishes as the patient grows older, this condition has been previously said to be self-limiting. New research shows that NE can be malignant. It can remain through childhood, and when not properly addressed and treated, is diagnosed in up to 1% of adults.[1,3] There is continuing debate on whether this condition is physiologically or anatomically based which is still being deliberated, but recent studies support research that shows NE as multifaceted disorder consisting of multiple pathological factors including genetics, in addition to psychological and anatomical issues.[3]

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Parents also reported an overall improvement of 80% in regard to the remaining conditions including ear infections, allergies, asthma, ADHD, and headaches.

Improvement in behavior and attention in a 7-year-old girl with ADHD receiving chiropractic care: A case report and review of the literature

By Cassandra Fairest, B. Chiro[1,2] and David Russell, BSc (Psych), BSc (Chiro), Cert TT[1,3]

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2. Council member, New Zealand Chiropractors' Association
3. Board member, Scotland College of Chiropractic Trust

ABSTRACT

Objectives: To present the case of a 7-year-old female previously diagnosed with Attention-Deficit Hyperactivity Disorder (ADHD), and the improvement and management of symptoms under regular chiropractic care, including the integration of a retained asymmetrical tonic neck reflex (ATNR). **Methods:** Online review of the literature on motor development delay and chiropractic was performed using The Index to Chiropractic Literature, PubMed and Google Scholar. Search terms "ADHD", "chiropractic" and "spinal manipulation" were used. **Clinical features:** A 7-year-old female previously diagnosed with ADHD presented with anxiety, sleep disturbances, learning difficulties and behavioral issues. Her mother reported sleep disturbances began at 22-months following a fall onto her forehead. Previous treatments for ADHD, including behavioral therapy, psychotherapy and dietary intervention, had marginal success. A retained ATNR and aberrant H-test (cranial nerves III, IV, and VI) was identified. Direct objective indicators of vertebral subluxation at C1, T2, T4, T9, and sacrum were identified on spinal examination. **Intervention and outcomes:** Modified Diversified using an Activator instrument as a force application was applied to correct vertebral subluxation. Within the 4 visits, the child's behavior, mood and sleep patterns had improved, and the retained ATNR had integrated. Cranial nerve findings had resolved. Direct objective indicators of vertebral subluxation had reduced. Ongoing care continued to improve and manage the presenting behavioral symptoms. **Conclusion:** Chiropractic care focused on the correction of vertebral subluxation, was associated with improvements in the child's presenting symptoms associated with ADHD.

Key words: Attention Deficit Hyperactivity Disorder; ADHD; Chiropractic; Pediatric; Vertebral Subluxation; Chiropractic Spinal Manipulation.

Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is a complex pattern of persistent inattention and/or hyperactivity and impulsiveness that can interfere normal functioning or development.[1-3] Within the criteria, an individual's academic and/or occupational activities are assessed relative to the expected developmental level of that individuals age.[1-3] The inattentive and/or hyperactive-impulsive symptoms must have a detrimental effect on the quality of social, academic or occupational functioning.[3]

ADHD is considered to be common behavioral disorders in children and adolecents.[2,4,5] It has been estimated, through the Global Burden of Disease study, that 26 million children and adolescents have ADHD.[3] Over the past two decades there has been a significant increase in the prescription of medications for children diagnosed with ADHD.[6-8] Ritalin and Dexamphetamine are stimulants that have been used for over 40 years with short-term success in managing the symptoms of ADHD in 80-90% of children.[6] The steady increase in diagnoses of ADHD in the past decade is only compounded by the concern that current best practice for treatment (pharmaceutical intervention) does not actually treat the cause of ADHD, it only haphazardly manages the symptoms.[9]

Current non-pharmaceutical treatments for ADHD, including behavioral therapies,[10] educational therapies,[11] family counselling,[12] and dietary or nutritional intervention,[13,14] have exhibited varying degrees of success, though none stand out as significantly more effective than others. A common approach is to combine these methods to have a cumulative effect.[15]

Chiropractic care for the pediatric population has grown in acceptance.[16,17] Parents regularly choose chiropractic care to help manage common childhood conditions.[18,19] Chiropractic care aims to optimize health and wellbeing through the enhancement of the nervous system function by removing nerve interference caused by vertebral subluxation.[20] A vertebral subluxation represents an altered state of afferent input which can lead to maladaptive changes in central neural plasticity resulting in dysfunction.[20] The Australian Spinal Research Foundation developed a conceptual definition of vertebral subluxation that states, "A vertebral subluxation is a diminished state of being, comprising of a state of reduced

Reduction in symptoms associated with ADHD, was less anxious and had improved sleep patterns.

Improvement in her behavior and anxiety levels.

She was able to better concentrate.

The child had had a successful sleepover for the first time, and clinical examination revealed resolution of ATNR.

All by the fourth visit.

CASE STUDY

Improvement in Behavior, Anxiety & Pain Following Chiropractic Care in a 9-Year-Old Boy with Asperger's Syndrome and Anxiety Disorder: Case Report & Review of the Literature

Laura Stone, DC, MS[1] & Joel Alcantara, DC[2]

Abstract

Objective: To report on the positive health outcomes following chiropractic care experienced by a child with Asperger's Syndrome.

Clinical Features: A 9-year-old male with Asperger's Syndrome presented for care with complaints of neck pain, midback and low back pain, stomach aches and anxiety.

Intervention and Outcome: The patient was cared for with combinations of Gonstead and Thompson Technique at a frequency of care at 1 x/week for two months. Re-integration/brushing exercises of his hands and feet were also provided. The patient's musculoskeletal symptoms improved as did his behavioral challenges as measured by the Autism Treatment Evaluation Checklist for parents and quality of life as measured by the PROMIS-25 parent proxy measure.

Conclusion: This study provides supporting evidence on the benefits of chiropractic care in patients with ASD. Additional research on this is recommended.

Keywords: *Asperger's Syndrome, musculoskeletal complaints, pediatrics, subluxation, adjustment, spinal manipulation, autism*

Introduction

Defined as lifelong deficits in social communication and interaction, restricted and repetitive behaviors, interests, and activities[1], the prevalence of autism spectrum disorder (ASD) has increased dramatically in recent times to as high as 1-2% of children. In 2012, the combined estimated prevalence of ASD among the 11 ADDM Network sites in the United States was 14.6 per 1,000 or 1 in 68 children aged 8 years. This is a stark contrast to data indicating 1 in 110 children aged 8 years from previous years.

Estimated prevalence was significantly higher among boys aged 8 years (23.6 per 1,000) than among girls aged 8 years (5.3 per 1,000).[2] Loomes et al.[3] examined 54 studies involving 13,784,284 participants with whom 53,712 had ASD (i.e., 43,972 boys and 9,740 girls). According to the authors, the true male-to-female ratio is not 4:1 for ASD but rather more likely to be 3:1. In addition, they raised the issue that a diagnostic gender bias may exist such that girls who meet the diagnostic criteria for ASD are at disproportionate risk of not

1. Private Practice of Chiropractic, Hampton, IL
2. Research Director, International Chiropractic Pediatric Association, Media, PA

CASE STUDY

Improvement in ADHD Symptomatology Following Chiropractic in a 5-Year-Old Male: A Case Report & Review of the Literature

Chris Boman, DC[1] & Kelsey Stolarski, DC[2]

Abstract

Objective: This paper presents a case study of improved ADHD symptomatology for a child undergoing chiropractic care.

Clinical Features: A 5-year-old male presented to a chiropractic office for examination and history for the detection of vertebral subluxation. Thermal scanning and sEMG were utilized and it was determined that vertebral subluxations were present in conjunction with spinal tension, postural faults, and reduced range of motion in the cervical spine.

Intervention and Outcomes: The patient received a total of 54 adjustments in the upper cervical, thoracic, lumbar, and sacral regions over six months of care. Thermography and sEMG scans were performed at the initial visit and at two re-assessments. Patient progress was also monitored subjectively as the mother noted improvements in behavior. Instrumentation revealed improvement in symmetry and pattern.

Conclusions: The results of this case study reveal an overall positive outcome of ADHD symptomatology following chiropractic care.

Key Words: *Chiropractic, vertebral subluxation, Diversified, adjustment, ADHD, behavioral issues, sEMG, thermography*

Introduction

Attention Deficit Hyperactivity Disorder, often referred to as ADHD, is the most widely diagnosed neurodevelopmental disorder in childhood. It is comprised of three forms: inattention (ADHD-I), hyperactivity combined with impulsiveness (ADHD-H), or inattention paired with hyperactivity (ADHD-C).[1] 5.4 million, or 9.4%, of children from 6 to 17 years of age have been diagnosed with this condition in the United States.[2]

Annual rates of diagnosis continue to increase from 3% annually between 1997-2006 to an average of 5.5% annually between 2003-2007.[3] ADHD is a complex and difficult condition to diagnose as behavior and symptomatology must be present in settings outside the physician's office, such as the home and/or school. Moreover, children with ADHD typically present with comorbid conditions such as: learning disabilities, behavioral issues, anxiety, and depression.[2]

These issues may manifest as difficulty focusing, constant desire to be moving and not sitting still, being impatient, or easily distracted.[4] These conditions must alter a child's functional capability, including the academic realm and social circles.[2]

1. Private Practice of Chiropractic, Murietta, CA
2. Private Practice of Chiropractic, Wadsworth, OH

Described as "out of control" and exhibited a constant urge to bounce and jump.
The child had a history of ear infections
Neurodevelopmental delays were present skipped crawling and currently exhibited toe walking.

Teacher informed parent that the patient elicited behavioral changes and that he was becoming more focused with fewer disruptions in class.

Mother reported that the child behaved now during family functions. Patient was not stressed and/or hyperactive, but was talking with relatives, playing with the other kids, and enjoyed the company.

The child wrote a written letter by himself, a task that he could not previously accomplish. He was also improving in focus, listening skills, and sitting in his chair without fidgeting.

Asia-Pacific Chiropractic Journal

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CASE REPORT PROJECT

2022

Improvement in Physical Resilience and Management of ADHD in a 12-year-old Male under Chiropractic Care: A case report

Bruce Steinberg, Ruth Postlethwaite and Clare McIvor

Abstract: *Objective/Clinical Features* A 12-year-old male presented for chiropractic care with the primary concerns of ADHD, a mood disorder, and growing pains in his legs that had started a month prior. The patient had stopped taking Methylphenidate ER 30mg two weeks prior to presenting. Nerve function tests were performed (including paraspinal thermography, surface EMG and heart rate variability analysis). A prone leg check revealed a short right leg of one half an inch.

The right C1 was taut and tender, and the patient was positive for right cervical syndrome. Cervical spine x-rays were performed (including AP, lateral and AP open mouth). Relevant EMG and thermography findings included significant mid spine hypotonicity and significant imbalance in neural regulation confirming dysautonomia.

Intervention/Outcomes The patient was seen twice a week for twelve weeks. During this time, Torque Release Technique (TRT) and analysis was used. After the 12 weeks, the patient was reassessed. The parents reported a decrease in leg pain, and a complete resolution of allergies and strep infection. The patient was less confrontational and generally has a more positive demeanor. The mid spine hypotonicity was returning to normal and there was a significant change seen in the thoraco-lumbar junction.

Conclusion Chiropractic care for the reduction of vertebral subluxations may result in an improvement in physical resilience and the severity of ADHD related symptomatology. Further research is required.

Indexing Terms: Chiropractic; Subluxation; Torque Release Technique; ADHD; resilience.

Introduction

What happens when a growing nervous system is placed under internal or external stress? While the answer to this is potentially as vast as chiropractic literature itself, certain narratives within chiropractic care make sense neuro-spinally and interpersonally.

> *... The reduction of vertebral subluxations with significant change in the thoracolumbar junction was*

Asia-Pacific Chiropractic Journal

ASRF
CASE REPORT PROJECT

2023

Increased interpersonal connectedness and decreased agitation in a 6y male with Autism and Attention-Deficit-Hyperactive Disorder

Kevin Johnson, Ruth Postlethwaite and Clare McIvor

Background: A six-year-old male presented for Chiropractic care with a dual diagnosis of Autism, and Attention Deficit Hyperactive Disorder. The child's parents reported agitation and low interpersonal connectedness as primary concerns, and the child was non-verbal at the time of his presentation.

Management: The patient was placed on a six-month care plan during which he was checked for subluxations and adjusted according to the MC2 protocol.

Outcomes: At the conclusion of the care plan, parents and teachers reported that he his verbal ability was increasing, his agitation had significantly decreased, and his interpersonal skills were showing marked improvement.

Indexing Terms: Chiropractic; Subluxation; Autism; ADHD.

Introduction

Future Research



Chiropractic's ability to affect the drive of unconscious proprioception through the central nervous system coupled with its affects on the spinal limbic system, brain function, CSF and vascular flow are fertile areas for future chiropractic research.

Neurological Function



- Brain Waves
- P-300
- HRV
- SEMG
- Thermal
- SSEP’s

Foundation for Vertebral Subluxation

Areas of Focus

Populations:

- Military Veterans
- Seniors
- Children
- ALS

Maladaptations:

- Neurodegenerative Dx
- PTSD
- Concussions
- Depression
- Neurodevelopmental Dx
- Functional Dx

Foundation for Vertebral Subluxation

Measures

- Orthostatic Hypertension
- Catecholamines
- Norephinephrine
- HRV
- QT Intervals
- Fatigue Scale
- SRQOL

- Cardiac Sympathetic Imaging
- Cardiac Neuronal Architecture
- SPECT
- PET
- fMRI
- Genetic neuroimaging (fMRI & Molecular Genetics)

Measures

- Valid & Reliable Measures of Vertebral Subluxation
- Biomechanical
- Neurological

Example:

Upper Cervical

- X-ray
- Thermal Scanning
- Leg checks



Risk Management

Horrendous Act

"Perhaps the most horrendous act of all is the pretense of chiropractors who claim to locate and adjust vertebral subluxations in the cartilaginous spine of a newborn baby, risking injury to epiphyseal growth centers (or worse).

At the end of the day and at the end of life, unethical chiropractors must deal with the guilt that occurs as a result of knowingly mistreating children or misleading patients who are allowed to suffer needlessly in order to complete a course of subluxation treatment guaranteed to remove the cause of the problem."

Samuel Homola DC

ChiroFutures

Securing the Future – Managing Your Risk

CHIROFUTURES.ORG

UNDERSTANDING THE

Gentle Touch:

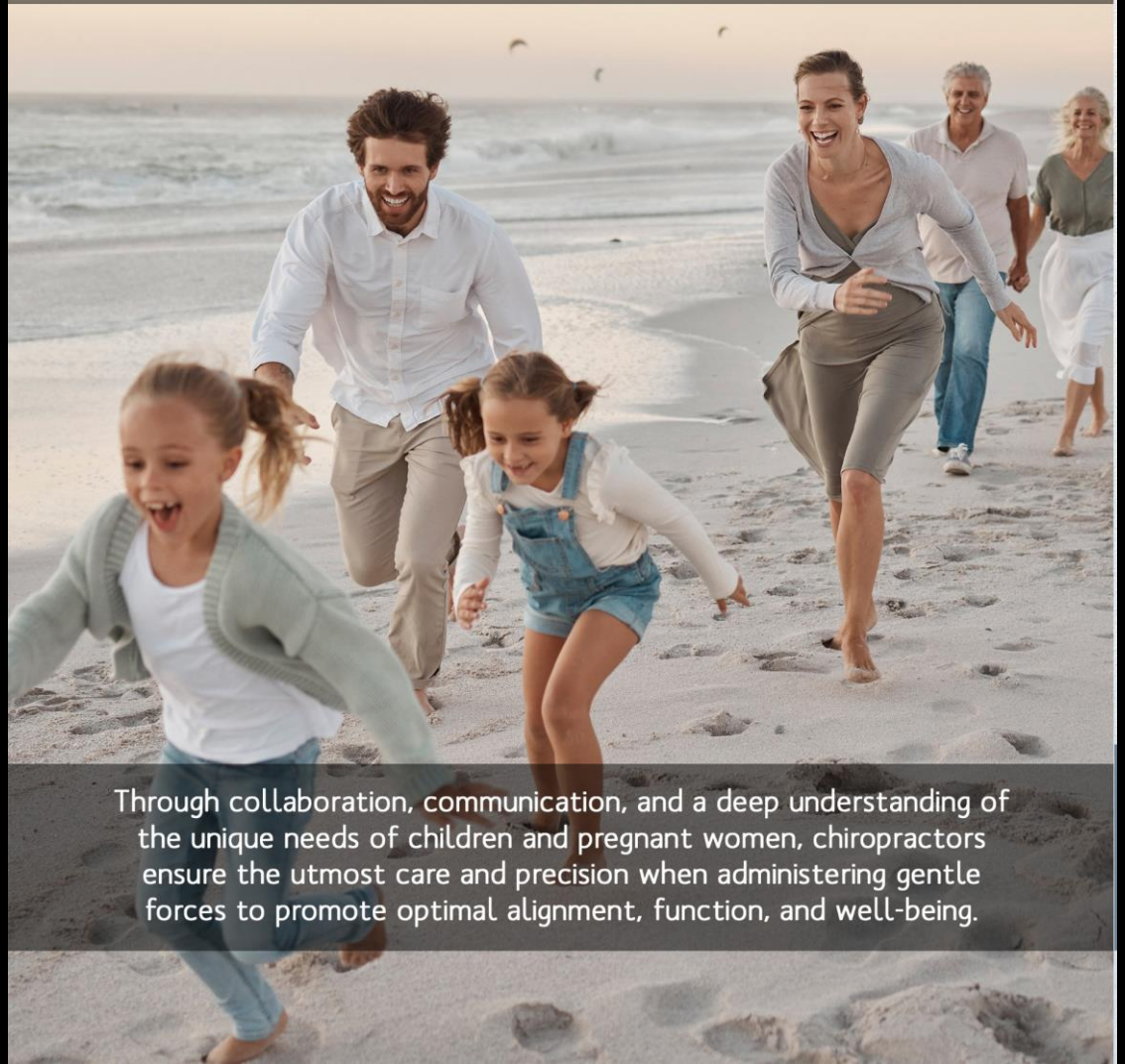
THE DELICATE FORCE BEHIND CHIROPRACTIC ADJUSTMENTS



Exploring the Safe and Gentle Techniques Utilized in Pediatric & Maternal Chiropractic Care

This information provided by ChiroFutures Malpractice Insurance Program

Chiropractic Adjustments are **SAFE** and **EFFECTIVE** in Children and Pregnant Women



Through collaboration, communication, and a deep understanding of the unique needs of children and pregnant women, chiropractors ensure the utmost care and precision when administering gentle forces to promote optimal alignment, function, and well-being.

INVESTIGATION

Chiropractors at a crossroads: The fight for evidence-based treatment and a profession's reputation

For more than a decade, Ontario's regulator has been steered by 'vitalists' who promote unscientific treatments for virtually any disease. Now a growing faction is urging change

PAUL BENEDETTI AND WAYNE MACPHAIL
SPECIAL TO THE GLOBE AND MAIL
PUBLISHED NOVEMBER 1, 2018
UPDATED NOVEMBER 5, 2018



Unscientific Views?

“The daily practice and application of the Laws of Life and Vitalistic Universal Principles distinguish Chiropractic within the field of healthcare,” writes Dr. Elizabeth Anderson-Peacock in her recently published book Pearls of Wisdom – Pure & Powerful. She is the vice-president of the regulator.

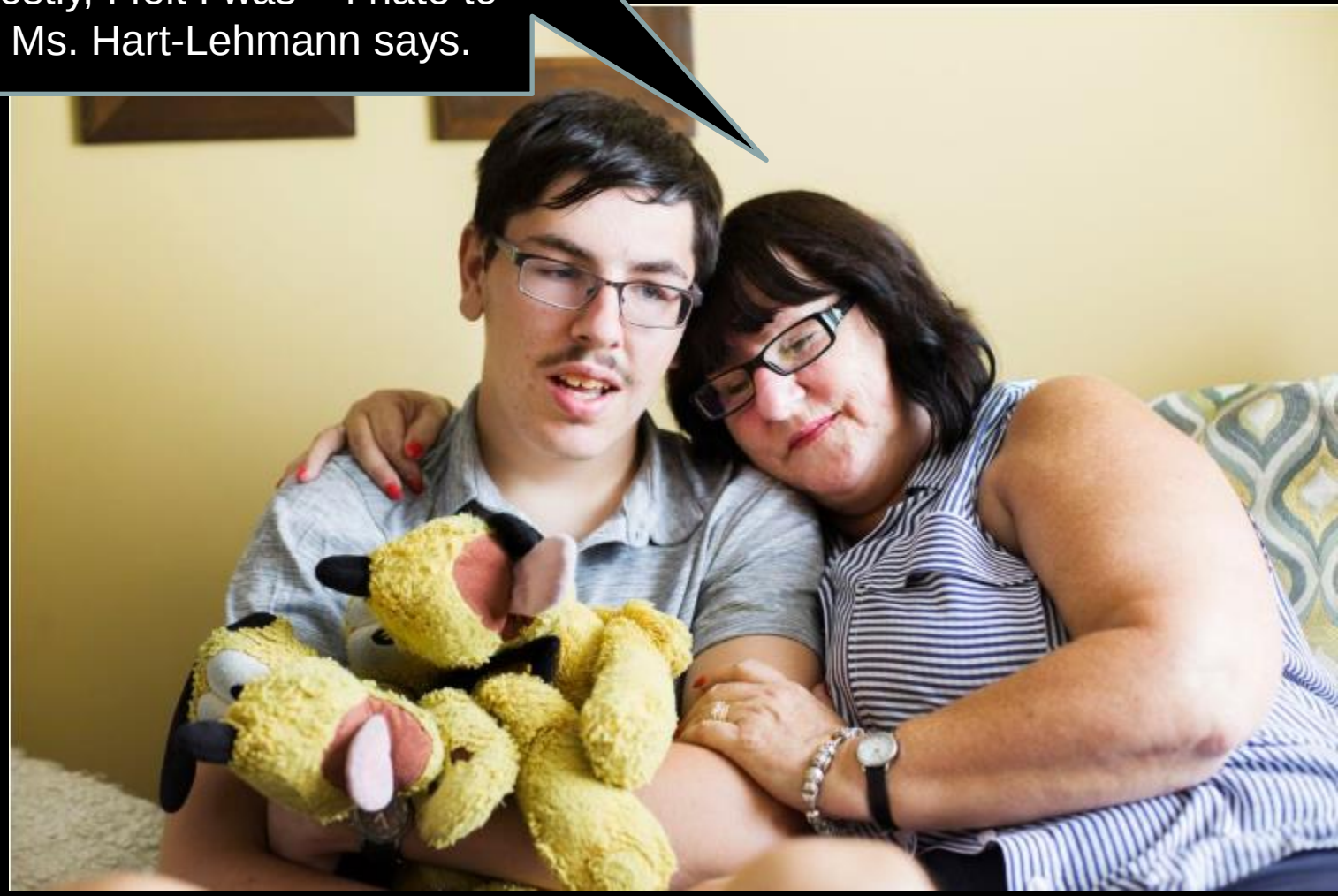
Unscientific Views?

“Within each and every one of us is infinite potential which we call innate intelligence that expresses itself over our nervous system. And, if we live fully connected to this intelligence all possibilities are within our reach … healing on any level is possible if we can release this intelligence and keep it flowing without interference.”

Unscientific Views?

“Physical, chemical and emotional stress is the underlying cause of subluxations.”

When Christopher Lehmann of Innisfil, Ont., was nine years old, his mother, Sandy Hart-Lehmann, took him to a chiropractor who claimed treatments could 'correct' his autism. The family spent at least $5,000 before Christopher called a halt to the treatments. 'Honestly, I felt I was – I hate to say it – duped,' Ms. Hart-Lehmann says.



Substitution Harm

[redacted] Board of Chiropractic Examiners

2006

Phon
Fa

E-Mail:

Fax

To: Phone:

From: Pages: (including Cover) 3

Re: Date: December 10,

CC:

☐ Urgent ☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

• Comments:

Dr.

I apologize for not getting back to you sooner about this, but I reviewed it with Dr. and he has some questions concerning the and the proposed advertisement.

Please explain what the and what diagnostic equipment is used and what justification is needed to perform the test(s).

Also, please provide documentation that the subluxation causes decreased human potential and function.

Thanks!

"Also, please provide documentation that the subluxation causes decreased human potential and function."

23. Specifically address whether chiropractic care can cure, or otherwise alleviate, in whole or in part, the following common childhood conditions or behaviors or other diseases that may affect a child: (a) "spitting up," reflux, constipation, and other common stomach or gastrointestinal upsets, (b) preferring to breastfeed or nurse on one breast, (c) ear infections, whether viral or bacterial, (d) RSV, (e) fever, (f) colic, (g) crying or fussiness, (h) cystic fibrosis, (i) cancer, (j) arching the back, (k) turning the head more to one side more often than the other; (l) waking up in the middle of the night. If you answer affirmatively with respect to any of the foregoing conditions or behaviors, for each such condition or behavior explain in detail why you believe chiropractic can cure, or otherwise alleviate, in whole or in part, that common childhood condition or behavior. Identify all medical literature and evidence that you believe supports each claimed benefit to the child.

NO CHILDREN
NO EXCEPTIONS

CNA

CNA Healthpro
[redacted]

[redacted]
Professional Liability Claims Department
[redacted]
Facsimile [redacted]
[redacted]

[redacted]

Matthew McCoy, D.C.
138 Dockside Downs Drive
Woodstock, GA 30189

Claim Number [redacted]
[redacted]C.

Dear Dr. McCoy:

Enclosed please find materials for your review of the referenced claim, which is submitted pursuant to your agreement with Columbia Casualty Company (a division of the CNA Insurance Companies) for these services. Briefly, this concerns a patient's claim that she paid for chiropractic services which were unnecessary, and for which she sought a refund. Dr. [redacted], insured by this Company, does not feel this claim has merit and has requested your impartial review.

Enclosed are the following:

1. A copy of the patient's (attorney's) letter which initiated the claim;
2. Copies of records from Dr. [redacted] office
3. Copies or records from subsequent treaters [redacted]

I would appreciate your earliest review of this matter, and please feel free to send me your report by email attachment (address above), returning the file materials later. Thank you very much.

Sincerely,

[redacted]

[redacted]
Columbia Casualty Company

Autism - Orthopedist

[redacted]

PROFESSIONAL CORPORATION
ATTORNEYS AT LAW

[redacted]
5445[redacted]
[redacted]
[redacted]COLORADO[redacted]

TELEPHONE: [redacted]
FAX: [redacted]
WEBSITE: [redacted]

[redacted]

VIA FEDERAL EXPRESS

Matthew McCoy, D.C.
138 Dockside Downs Drive
Woodstock, Georgia 30189

Re: [redacted]
Our File Number: [redacted]

Dear Dr. [redacted]

Thank you for agreeing to evaluate this matter for me. As I described, I represent [redacted] a chiropractor who was providing care to [redacted] in December of [redacted]. During a chiropractic treatment, [redacted] finger became trapped in a chiropractic table and was almost amputated. [redacted] had subsequent surgery in an attempt to restore the finger.

As you will see from the attached medical records, [redacted] had Attention Deficit Disorder before his finger injury, but there are allegations in the lawsuit that the injury exacerbated the Attention Deficit Disorder, has harmed [redacted] academic performance, and caused him to suffer from Post Traumatic Stress Disorder. I am not seeking your opinion on these matters, but I wanted to give you an idea of the damages claimed in the lawsuit.

Dr. [redacted] operated a chiropractic practice in [redacted] Colorado. Dr. [redacted] would occasionally conduct health screenings at health clubs. Mrs. [redacted] approached Dr. [redacted] at one of the health screenings, at which Dr. [redacted] had a banner describing that potential patients could "Get Answers Here" about various health problems.

ADHD - Table

(2) "Chiropractic" means the adjustment of the articulations of the human body, including ilium, sacrum, and coccyx, and the use of X-ray, provided that the X-ray shall not be used for therapeutical purposes. The term "chiropractic" shall also mean that separate and distinct branch of the healing arts whose science and art utilize the inherent recuperative powers of the body and the relationship between the musculoskeletal structures and functions of the body, particularly of the spinal column and the nervous system, in the restoration and maintenance of health. Chiropractic is a learned profession which teaches that the relationship between structure and function in the human body is a significant health factor and that such relationships between the spinal column and the nervous system are most significant, since the normal transmission and expression of nerve energy are essential to the restoration and maintenance of health. However, the term "chiropractic" shall not include the use of drugs or surgery. The adjustment referred to in this paragraph and subsection (b) of Code Section 43-9-16 may only be administered by a doctor of chiropractic authorized to do so by the provisions of this chapter; provided, however, that

Georgia Law

(4) "Subluxation" means a complex of functional or pathological articular changes that compromise neural integrity and general health. A subluxation is evaluated, diagnosed, and managed through the use of chiropractic procedures based on the best available rational and empirical evidence.

Georgia Law

(6) Engaged in any unprofessional, immoral, unethical, deceptive, or deleterious conduct or practice harmful to the public, which conduct or practice materially affects the fitness of the licensee or applicant to practice chiropractic, or of a nature likely to jeopardize the interest of the public, which conduct or practice need not have resulted in actual injury to any person or be directly related to the practice of chiropractic but shows that the licensee or applicant has committed any act or omission which is indicative of bad moral character or untrustworthiness; unprofessional conduct shall also include any departure from, or the failure to conform to, the minimal standards of acceptable and prevailing practice of chiropractic;

(6) Engaged in any unprofessional, immoral, unethical, deceptive, or deleterious conduct or practice harmful to the public, which conduct or practice materially affects the fitness of the licensee or applicant to practice chiropractic, or of a nature likely to jeopardize the interest of the public, which conduct or practice need not have resulted in actual injury to any person or be directly related to the practice of chiropractic but shows that the licensee or applicant has committed any act or omission which is indicative of bad moral character or untrustworthiness; unprofessional conduct shall also include any departure from, or the failure to conform to, the minimal standards of acceptable and prevailing practice of chiropractic;

Georgia Law

(2) A licensee shall not make any false, misleading, or deceptive communication in any form of advertising nor shall the licensee utilize any form of advertising which has the capacity or tendency to deceive, mislead, or confuse the recipient in any manner including but not limited to the following:

(a) Advertising which contains a misrepresentation of any fact or facts including advertising which has the capacity or tendency to mislead, deceive , or confuse any potential recipient either through false or misleading claims or by failing to disclose relevant or material facts;

(b) Advertising which conveys the impression of professional superiority or other superior attributes that cannot be substantiated. Licensees may not advertise that they have certifications or have attained diplomate status without having been conferred the title of diplomate or having received certifications by one or more of the groups found in board rule 100-4-.02.

(c) Advertising that has the capacity or tendency to create false or unjustified expectations of beneficial treatment or successful cures;

(d) Advertising that contains any guarantee of the results of any services;

(e) Advertising of services that the licensee is not licensed to perform in this state;

(f) Advertising, including that place in a classified or telephone directory, under a heading which may foster confusion about the professional status of the chiropractor or under a professional heading in which the chiropractor is not licensed;

(g) Advertising a transaction that is in itself illegal;

Georgia Rules

Inappropriate Representation

Rule 100-7-.02 Inappropriate Representation

(1) For the purposes of this Section, inappropriate representation shall include, but not be limited to, the following:

(a) knowingly making **misleading, deceptive, untrue or fraudulent representations** in the practice of chiropractic.

Communication

The communication involves **coercion, duress, fraud, *overreaching*, harassment, intimidation or *undue influence*;**

(d) The chiropractor knows or reasonably should know the **physical, emotional or mental state** of the person is such that the person cannot exercise reasonable judgment in seeking chiropractic care services.

Rule 14 Untrue, Deceptive or Misleading Practices Regarding Unproven and/or Unnecessary Services

Practices which are untrue, deceptive or misleading pursuant to §12-33-107(1)(h), C.R.S. include but are not limited to the use of promotional materials which have the effect of enticing patients to a provider's office for unproven and/or unnecessary services as listed in Rule 15, unless the advertisement has an adequate disclaimer.

Colorado

Rule 15 Procedures which are Unproven and Require Informed Consent

A. When an unproven procedure is provided, the chiropractor must obtain the written informed consent of the patient or the patient's legal representative.

B. The following criteria will be used to determine, by a preponderance of evidence, whether a procedure is unproven:

1. Whether the procedure is taught as part of the regular curriculum of at least one college of chiropractic approved by the Council on Chiropractic Education.

2. Whether the procedure is based upon anatomical, physiological and/or structural relationships which can be verified through standard diagnostic procedures.

3. Whether the procedure has been supported by a body of evidence using standard scientific research methodology and whether the procedure has had periodic review by the Board based on current research as evidenced by:

a. Publication in a peer reviewed professional or scientific journal (e.g. Spine, Journal of Manipulative and Physiological Therapeutics (JMPT), Bone and Joint Surgery).

b. Supportive preliminary results in a peer review journal.

c. Investigation in progress, sponsored by an agency independent of the procedure's proponents and/or developers ~~(e.g., Federation of Chiropractic Education and Research)~~.

d. Hypothesis clearly derived from supportive literature published in peer reviewed journals or texts.

C. Informed consent shall consist of the following: the patient shall be notified in writing that the procedure has been designated "unproven" by the Board and that its effectiveness has not been demonstrated.

D. The patient shall be required to sign a written consent form before a licensee may use a procedure designated "unproven" . The consent form shall indicate conspicuously that the procedure anticipated for use has been designated "unproven" by the Colorado State Board of Chiropractic Examiners and that permission is granted by the patient to proceed. A copy of this signed consent form shall be given to the patient for the patient's retention.

E. Procedures, protocol, analysis or methodology which are unproven and require informed consent include, but are not limited to:

1. Soft or cold laser for uses not approved by the Food and Drug Administration.

2. Reams Procedure.

3. Iridology.

4. Reflexology.

5. Contact reflex analysis.

6. Diagnostic spinal ultrasound for the use of diagnosing paraspinal muscle inflammation, posterior joint swelling, nerve root inflammation, or other spinal pathology in the adult population.

7. Any practice system, analysis, method, or protocol which does not include the complete assessment, evaluation, or diagnosis of the condition to be treated before beginning treatment of the patient.

8. Any practice system, analysis, method or protocol, which relies upon diagnostic methods that are not generally recognized or accepted within the profession or which do not have scientific validity.

9. Any practice system, analysis, method, or protocol, which is represented as a means of attaining spiritual growth, comfort, or well-being.



Informed Consent

Valid Consent

For consent to be valid, patients must be competent to make the particular decision, and give consent voluntarily after receiving appropriate information.

2 Questions

What is the standard for determining if doctors have properly discharged their responsibility to disclose information?

What categories of information must be discussed?

Professional Standard (Model)

Urges doctors to practice in accordance with what is accepted as proper by a responsible body of health care providers in the relevant clinical specialty.

Inherently paternalistic.

Emphasizes what doctors think is important to discuss with patients **rather than what the patient wants to discuss or wants disclosed**.

Reasonable Patient Standard

It is the prerogative of the patient, not the physician to determine where his interests seem to lie.

Inherently hypothetical Asks what risks should be disclosed to a *reasonable* patient in the particular patient's position.

Does not address what risks the *particular patient* would regard as important Only works for patients who behave like a *typical* patient

Disclosing Risk

A risk should be disclosed if a reasonable patient in what the doctor knows or should know to be the patient's position , would be likely to attach significance to the risk or cluster of risks in deciding whether or not to forego the proposed therapy.

Making consent patient centred

John Bridson, Clare Hammond, Austin Leach, Michael R Chester

Taking the time to explore patients' objectives not only improves consent procedures but may avoid some interventions altogether

Guidance on obtaining patients' consent for treatment encourages doctors to consider their needs and priorities when disclosing information.[1] However, the focus on disclosure, which has arisen from the need to tell patients about risk, has meant not enough attention is given to patients' objectives. To make consent properly patient centred, clinicians need to ask patients what they want from treatment before they discuss treatment strategies.[2] We believe this approach is essential, especially in the management of chronic illness. It should also help protect reticent patients, whose objectives may differ from the assumptions made by clinicians.

Background

Several UK organisations have published guidance on improving procedures for consent in the past few years (box 1). Despite this, the BMA's working party on consent stated that "current awareness of the relevant ethical and legal principles relating to consent among the medical profession is largely inadequate."[3] Although other initiatives have sought to improve guidance, the working party emphasised the need to improve implementation of what was already recommended as best practice.

The BMA's view, that patients would benefit if more clinicians were familiar with guidance on consent, may be right. However, our experience suggests that even full compliance with current guidance may not prevent unnecessary procedures in some patients.[4] Box 2 gives an example of one of the many patients at the National Refractory Angina Centre who conclude that coronary intervention is not necessary once they are given an opportunity to define their objectives and the risks are put in context. In this patient's case, only his first angioplasty was consistent with his objectives as it improved his chances of survival. The other procedures were aimed at relieving symptoms and may be associated with an increased risk of death.[5]

Box 1: Recent developments in guidance on consent practice

1998: GMC encourages clinicians to find out about patients' individual needs and priorities when deciding what information to disclose about interventions.[1]
2000: NHS Plan calls for change of culture in consent practice "to recognise the central importance of the rights of each patient"[4]
2001: Report of the Bristol Royal Infirmary inquiry calls on clinicians to acknowledge patients as partners with different but equal expertise[5]
2001: BMA consent working party emphasises consent as a process that gives patients the opportunity to express concerns about treatment[3]
2002: New model consent policy and consent forms implemented, incorporating check list to ensure clinicians disclose appropriate information when seeking patients' consent



Consent for procedures (such as angiography) must be founded on the patient's objectives

Information disclosure: standard and content

For consent to be valid, patients must be competent to make the particular decision and give consent voluntarily after receiving appropriate information. The issue of what constitutes appropriate information incorporates two questions: firstly, what is the standard for determining if clinicians have properly discharged their duty to disclose information and, secondly, what categories of information should be discussed?

Two standards for disclosure have been prominent. A professional standard applies in England and Wales. This requires clinicians' practice to be "in accordance with a practice accepted as proper by a responsible body of medical men" of ordinary skill in the relevant clinical specialty.[6] In Mrs Sidaway's landmark case, the House of

Unit for the Study of Health Care Ethics, Department of Primary Care, University of Liverpool, Liverpool L69 3GB
John Bridson *acting director of studies, M Sc in health care ethics*
National Refractory Angina Centre, Cardiothoracic Centre, Liverpool NHS Trust, Liverpool L14 3PE
Clare Hammond *specialist registrar in cardiology*
Austin Leach *consultant in anaesthesia and pain management*
Michael R Chester *director*
Correspondence to: John Bridson jbridson@liverpool.ac.uk

BMJ 2003;327:1159–61

Patient Centered Model

Patient Centered Model

Neither the *Professional Standard* nor the *Reasonable Patient Standard* provides the right frame work for patient centered consent.

Patient Centered Model

More current model of informed consent

Encourages doctors to consider the patients needs and priorities when discussing their healthcare options with them.

This approach demands that doctors **ask patients what they want from treatment** as they discuss treatment strategies.

Bridson, Hammond, Leach, Chester. Making Consent Patient Centered. British Medical Journal. Vol. 327. November 2003.

Patient Centered Model

In addition to fostering **patient autonomy**, this approach helps protect patients, whose objectives may differ from the assumptions made by the doctor.

This approach requires doctors to acknowledge patients as partners with different but equal expertise.

Patient Centered Model

Consent is a **process** that gives patients the opportunity to express concerns about treatment.

Inherent in this process is the approach of sharing information with the patient as opposed to disclosing information.

This allows a shared partnership between the patient and healthcare professional to develop where the patient and the professional meet as equals but with different expertise.

Patient Centered Model

Patient centered consent must be founded on the patient's objectives.

The practitioner must find out about patients' individual needs and priorities since their beliefs, culture, occupation or other factors may have a bearing on the information they need in order to reach a decision.

Patient centered practice requires doctors to offer patients an opportunity to participate in a shared decision making process about treatment options.

Doctors can then be guided by what patients want, rather than by professional assumptions about management of a disease.

Patient Centered Model

Ultimately, it is for patients and their doctors to decide if a treatment is appropriate and this forces doctors to be creative in order to respond with appropriate strategies.

Doctrine of Informed Consent

What treatments involve (Broadly)

Risks

Benefits

Alternatives

Implications of declining treatment

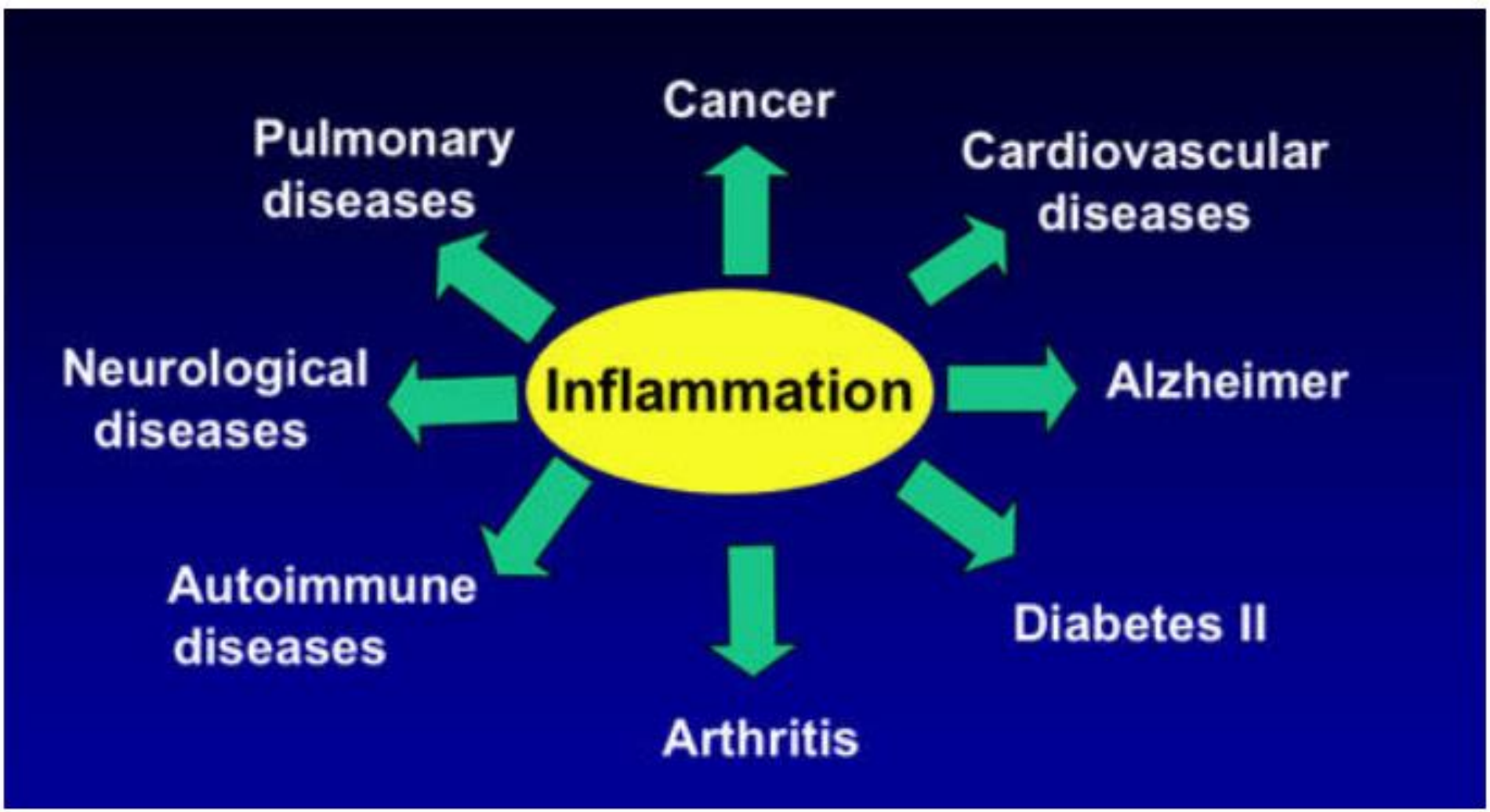


Over the past few years we have came across astonishing evidence relating inflammation to chronic dysfunctions to the endocrine (hormone) system, immune system, and nervous system.

Systems are being altered by inflammation causing abnormal blood chemistry.

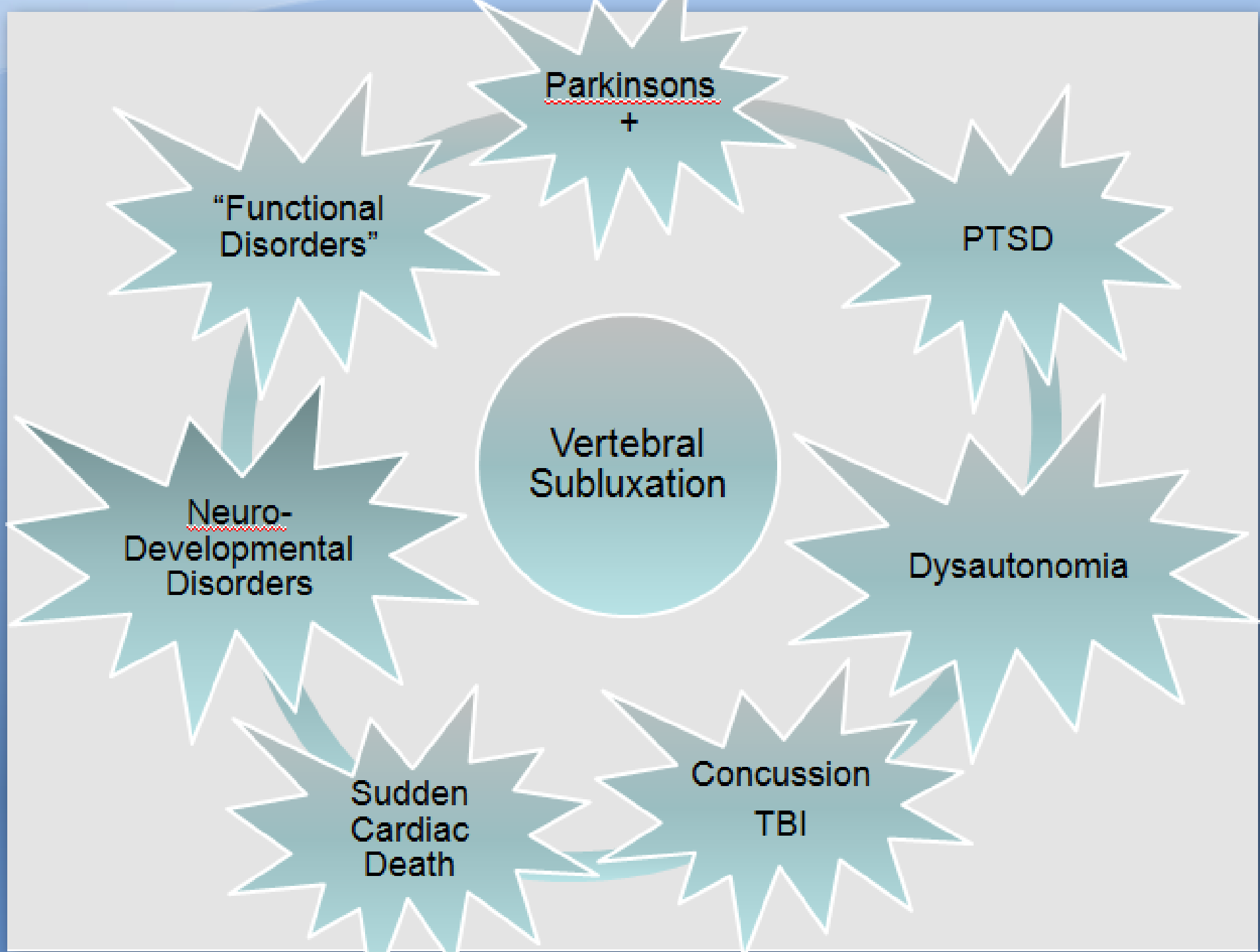
Over the past few years inflammation has been linked to cancer, heart attacks, Alzheimer's Disease, arthritis, inflammatory bowel disease, celiac disease, autoimmune disease, asthma, migraines and many more.

When inflammation becomes chronic the body begins to deteriorate losing the ability to function normally.



- Time Magazine: The Secret Killer, February 2004

Foundation for Vertebral Subluxation

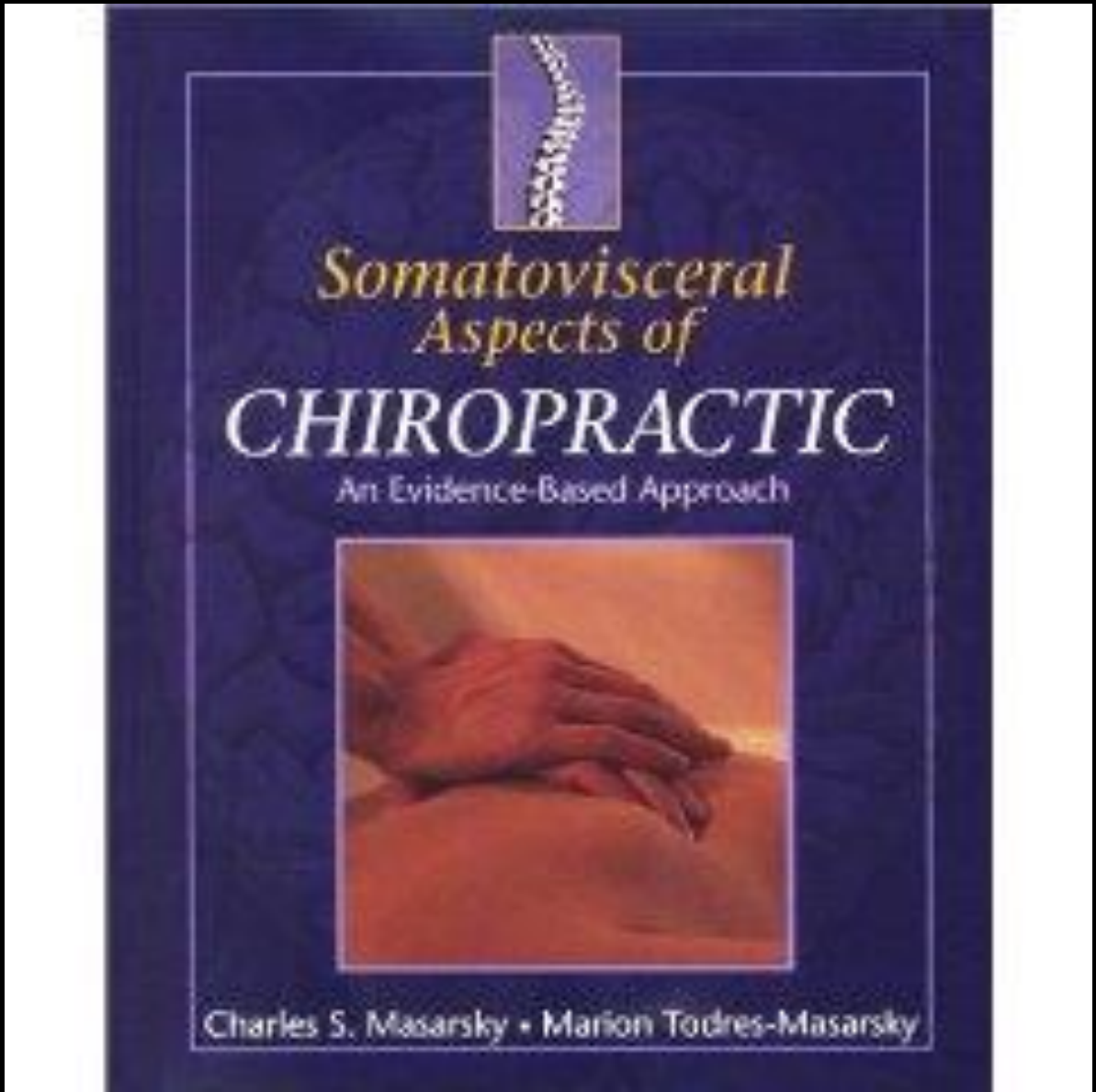

Parkinsons
+
"Functional Disorders"
PTSD
Vertebral Subluxation
Neuro-Developmental Disorders
Dysautonomia
Sudden Cardiac Death
Concussion
TBI

Inflammation

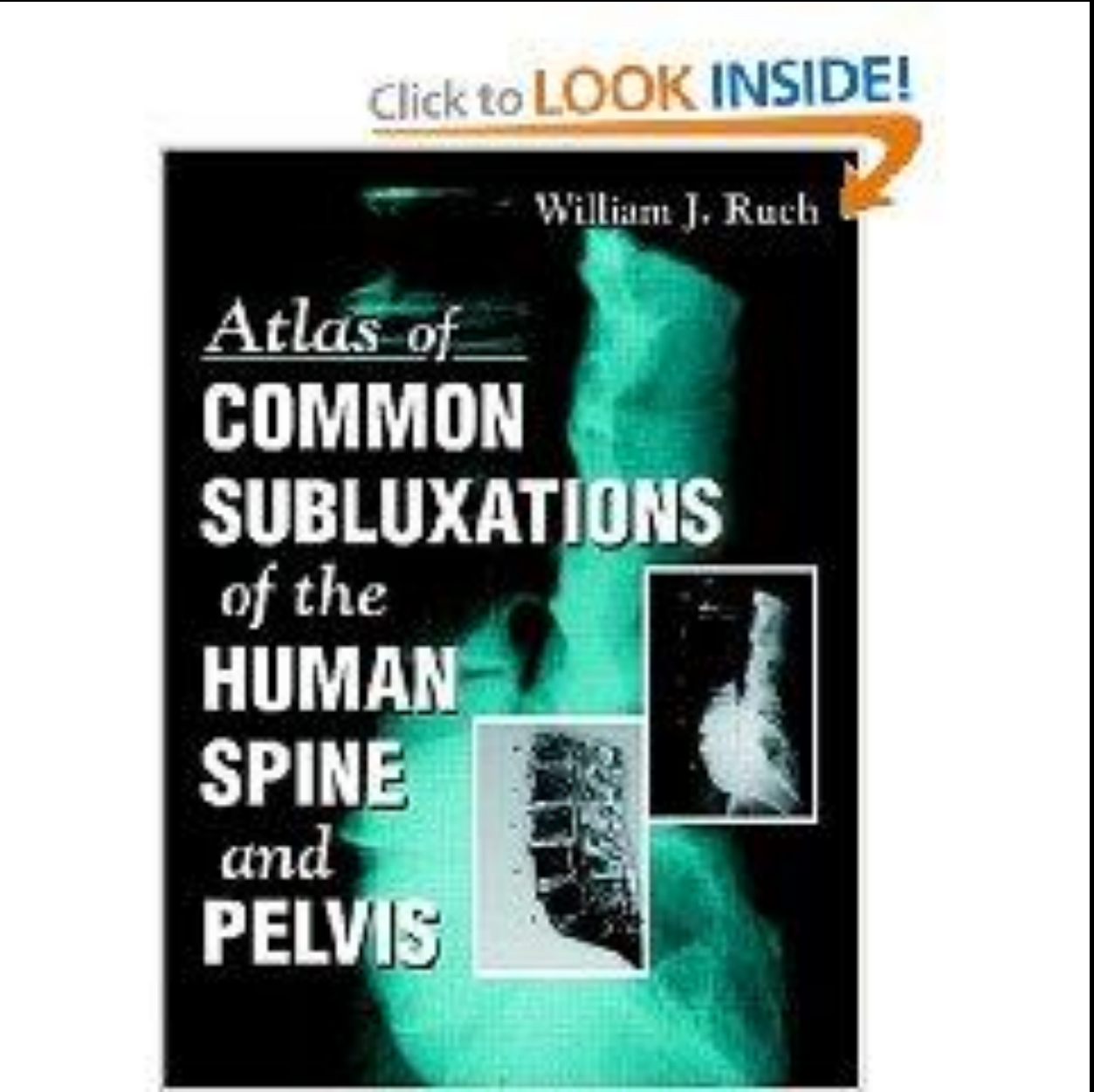
“Most modern people are boiling pots of inflammation: hot steaming, churning cauldrons of disordered, chaotic inflammatory responses.”

William Davis MD

Need Evidence?

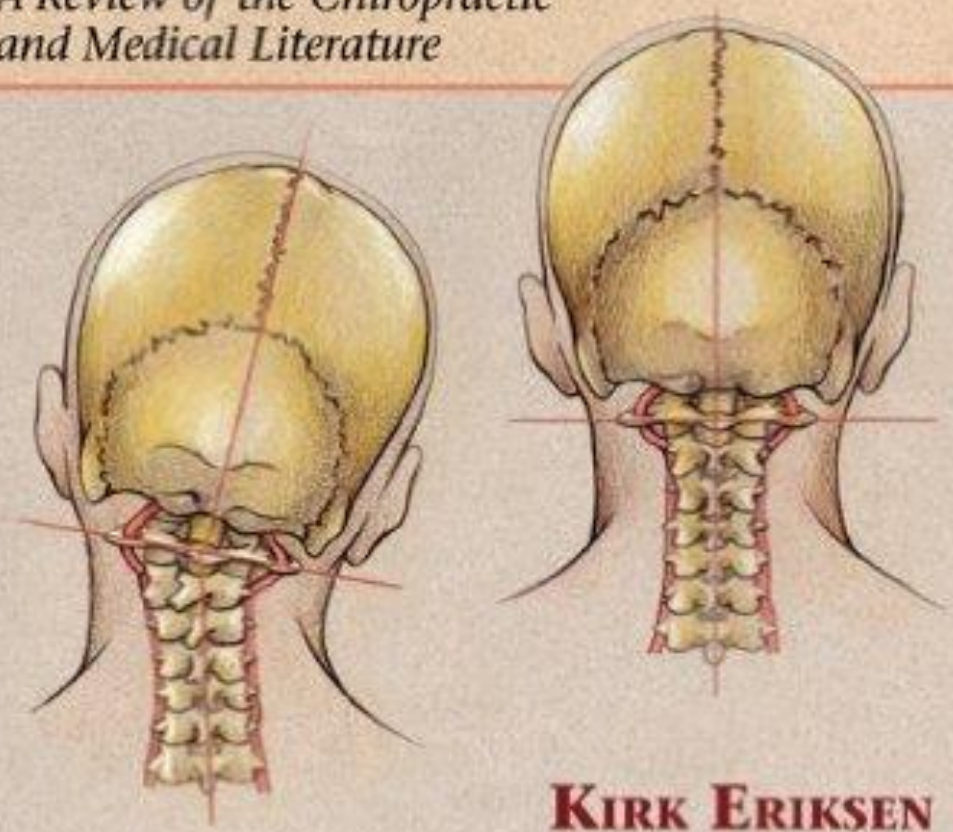


Need Evidence?



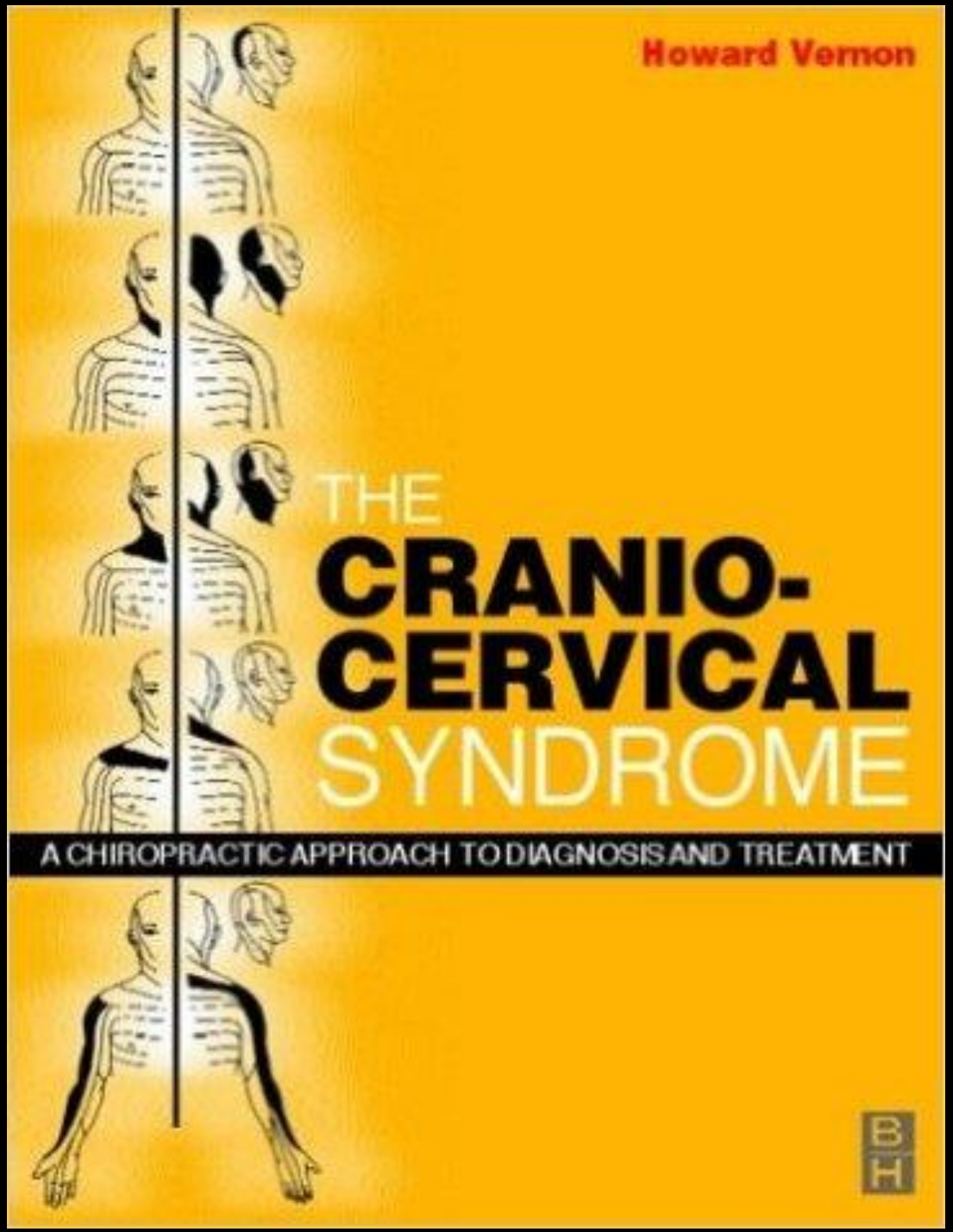
Upper Cervical Subluxation Complex

A Review of the Chiropractic and Medical Literature



Kirk Eriksen

Wolters Kluwer Health | Lippincott Williams & Wilkins


Howard Vernon
THE
CRANIO-
CERVICAL
SYNDROME
A CHIROPRACTIC APPROACH TO DIAGNOSIS AND TREATMENT
BH

The Craniocervical Syndrome and MRI

Editors
Francis W. Smith
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THE CHIROPRACTIC THEORIES

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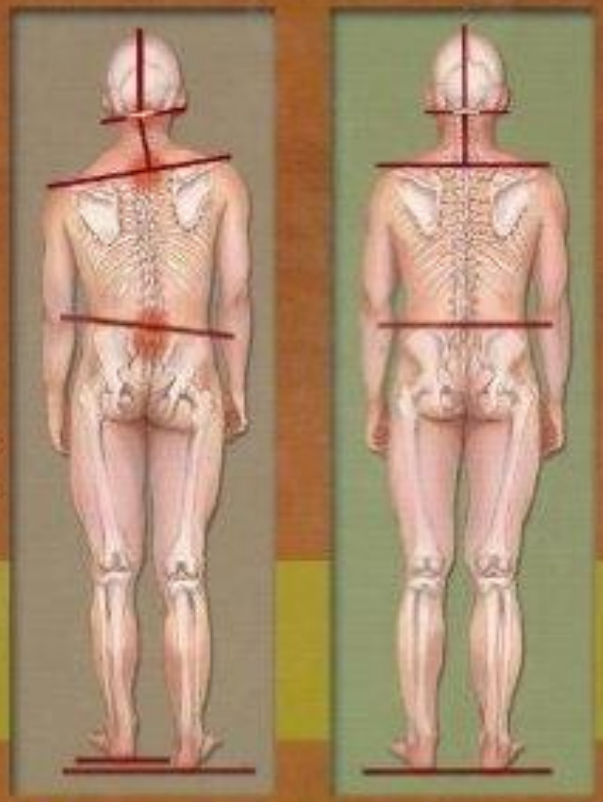
ROBERT A. LEACH



Wolters Kluwer | Lippincott Williams & Wilkins

ORTHOSPINOLOGY PROCEDURES

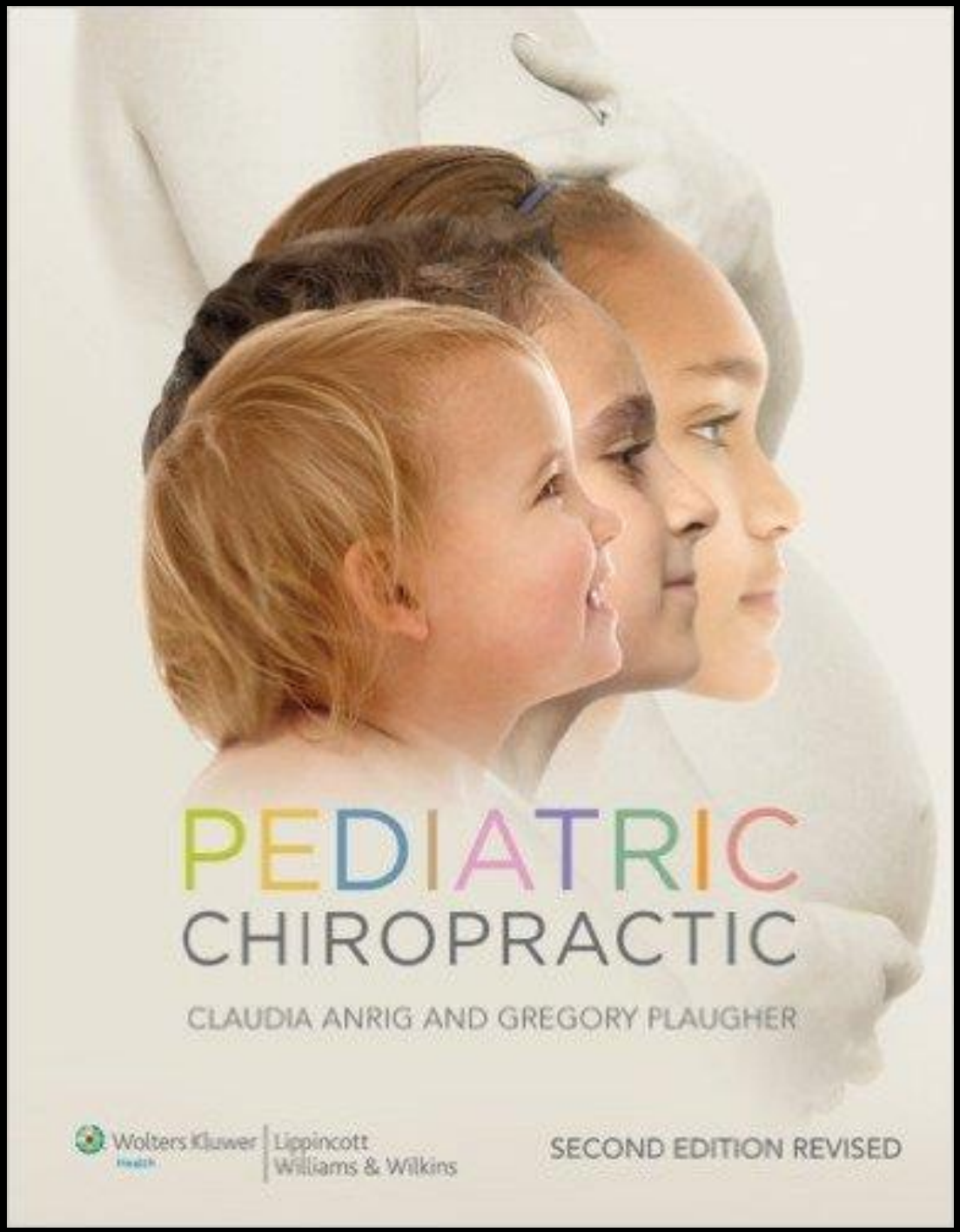
An Evidence-Based Approach to Spinal Care

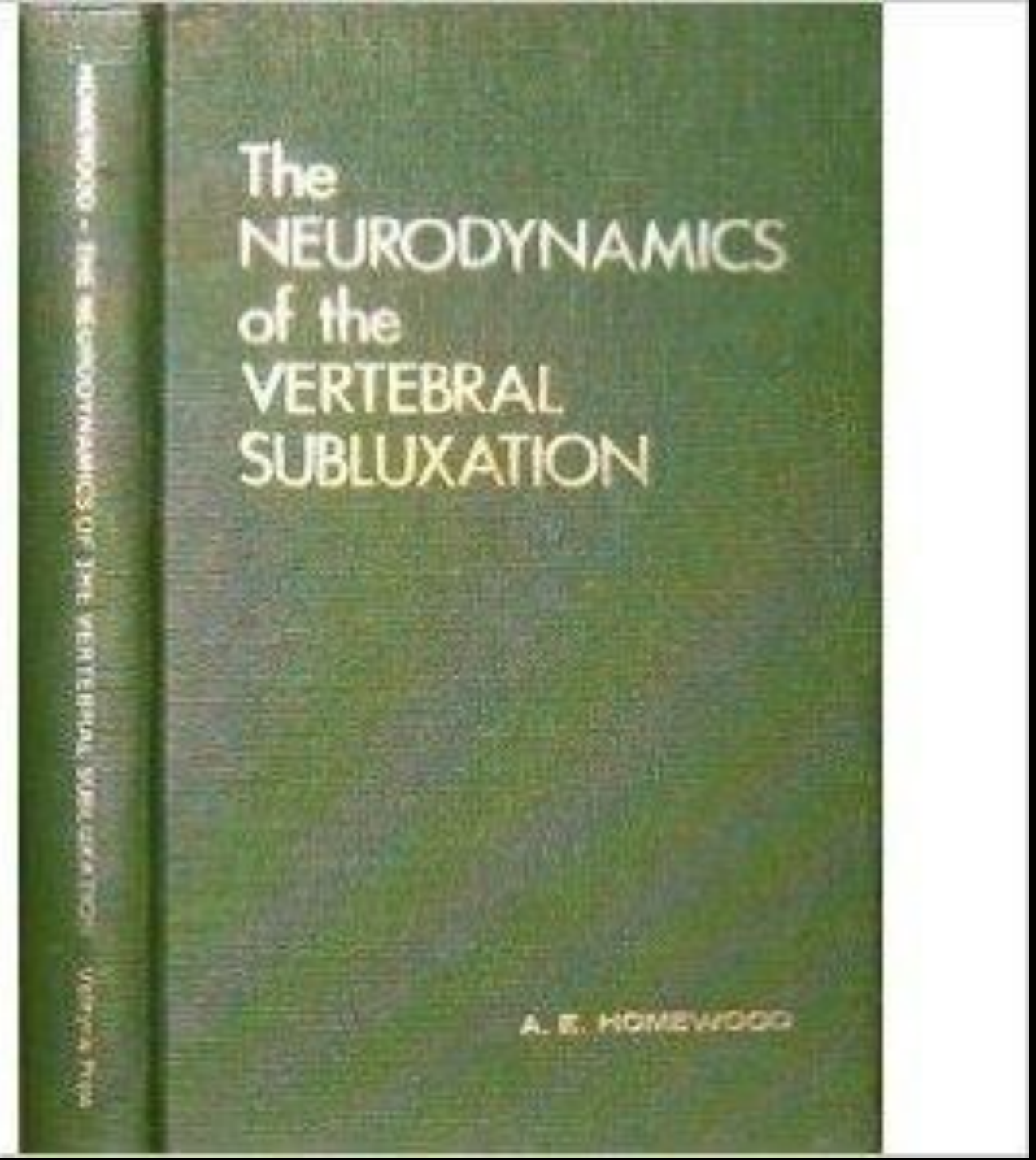


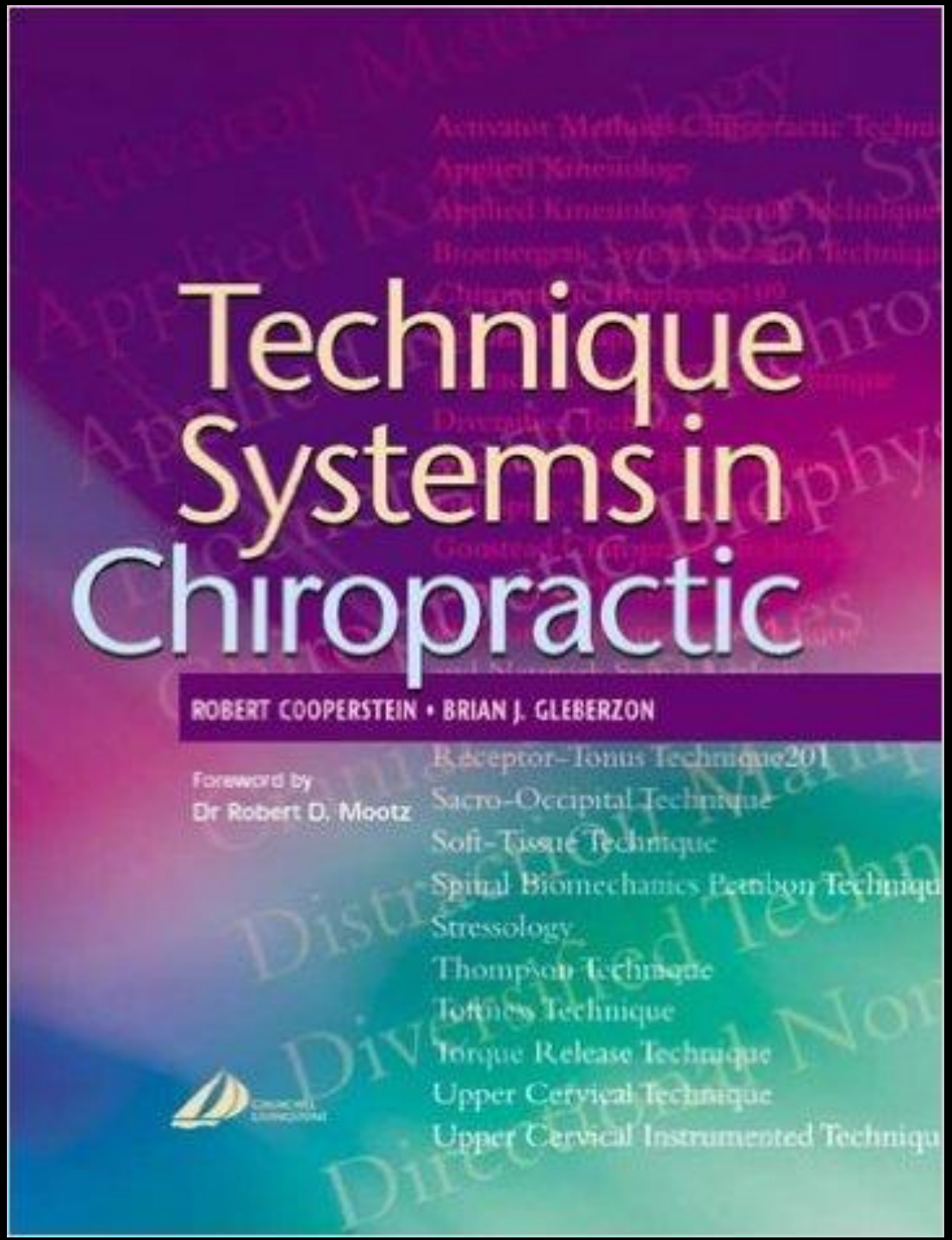
Kirk Eriksen
Roderic P. Rochester

Based on the John F. Grostic Model and Procedure

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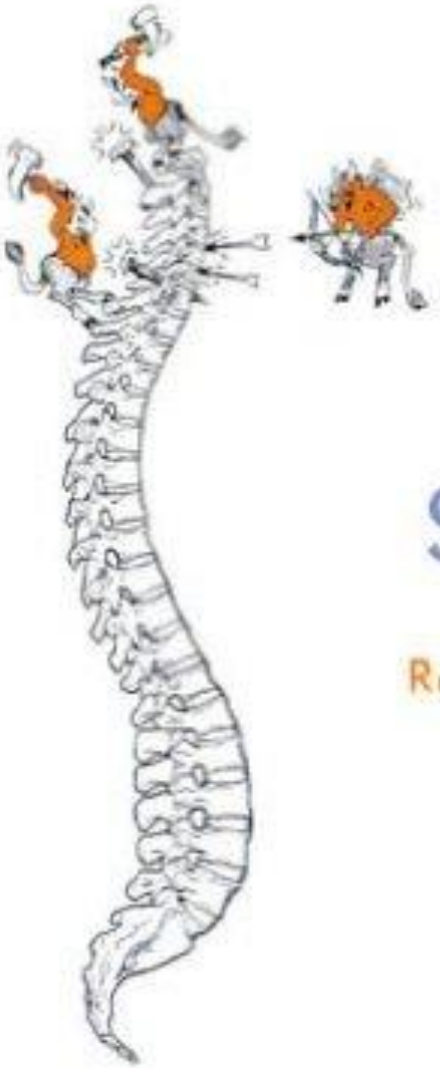

The NEURODYNAMICS of the VERTEBRAL SUBLUXATION
A. E. HOMEWOOD


Technique Systems in Chiropractic
ROBERT COOPERSTEIN • BRIAN J. GLEBERZON
Foreword by
Dr Robert D. Mootz
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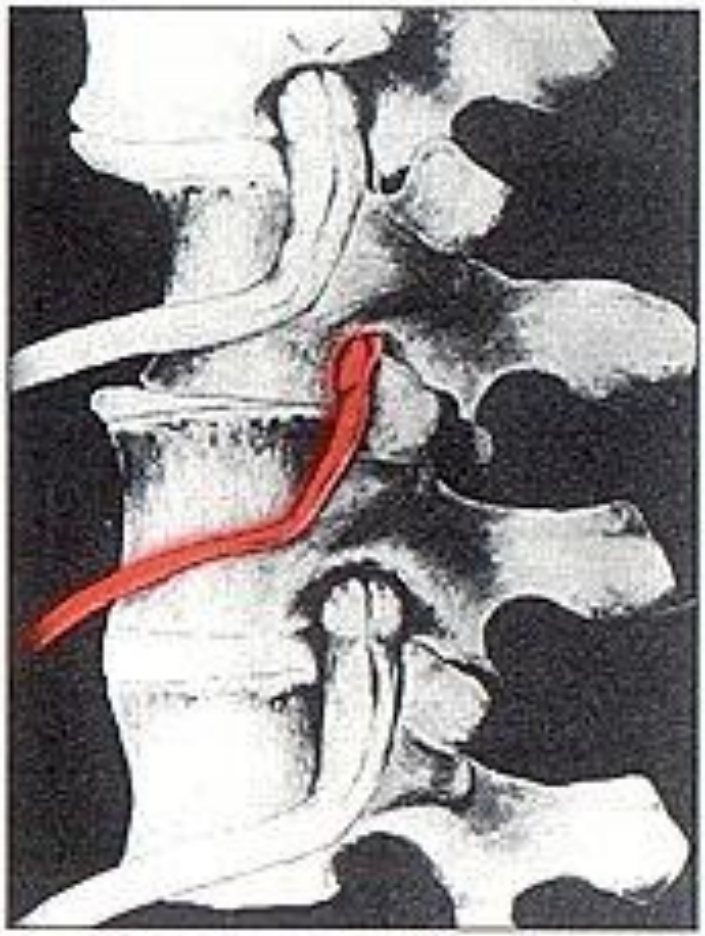
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- Know what normal and abnormal is
- Know how to communicate them
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- Help take them where they need to go
- Have a big mission

Normal



Abnormal – Kinesiopathology - Phase 1



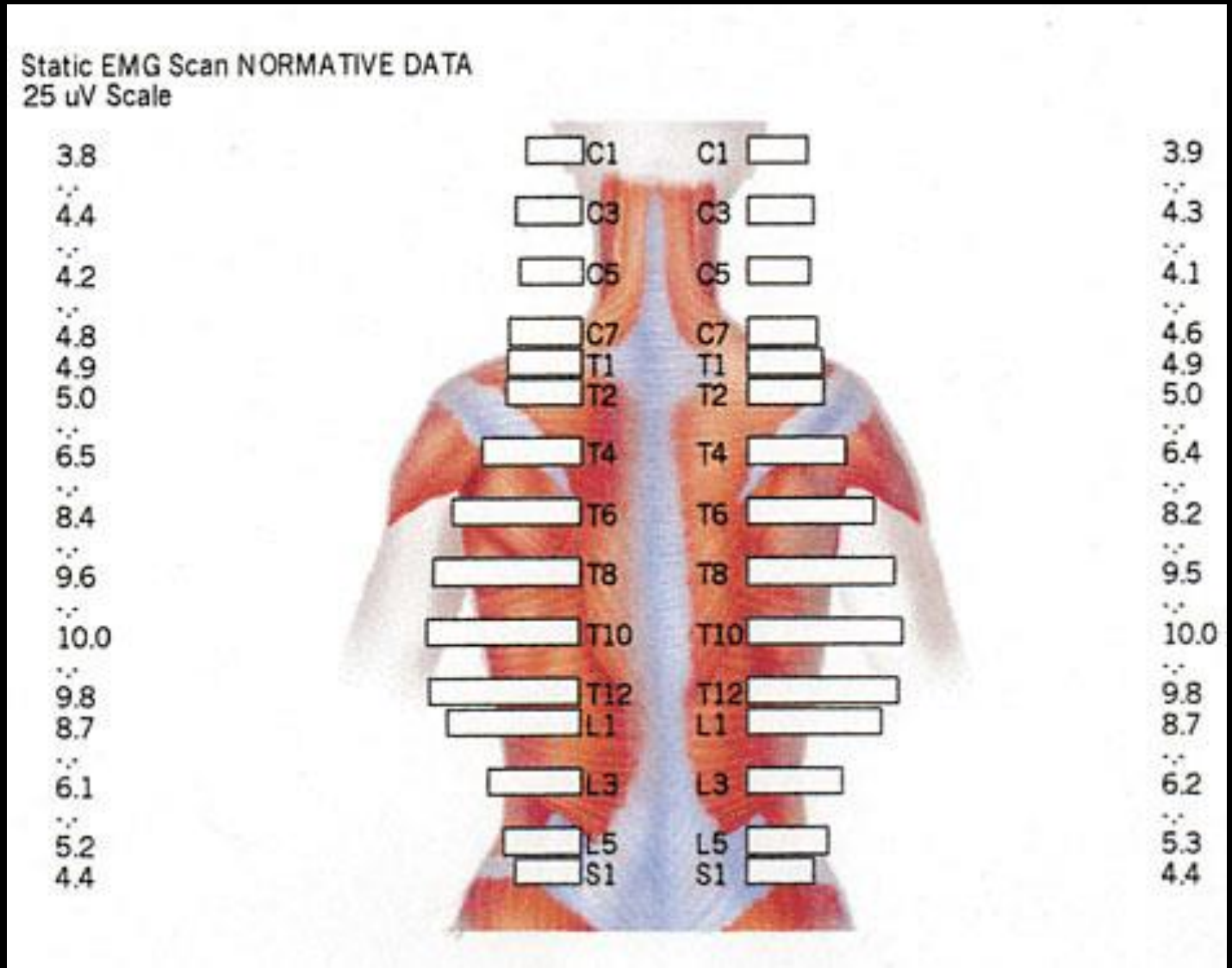
Abnormal – Kinesiopathology - Phase 2



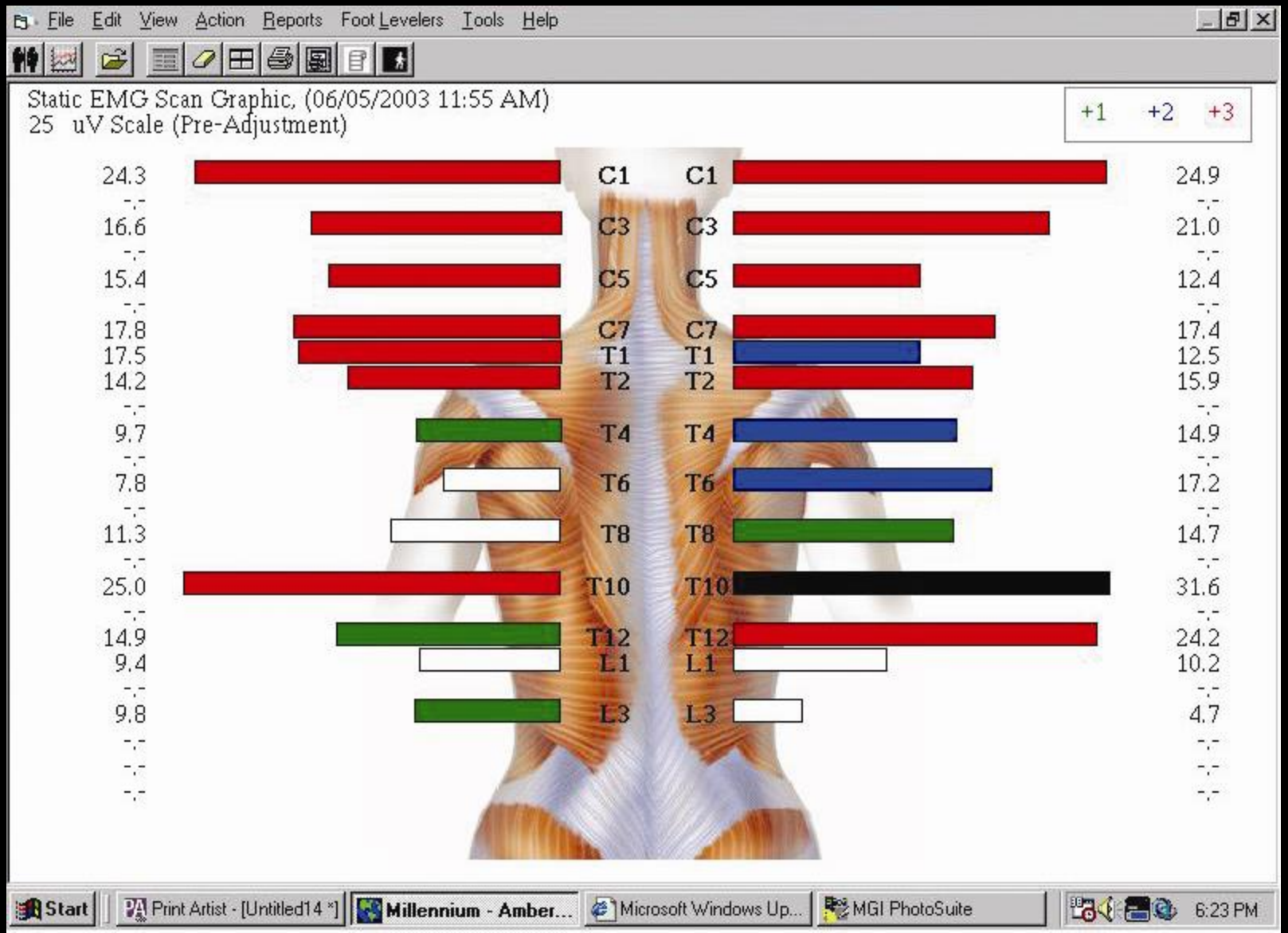
Abnormal – Kinesiopathology - Phase 3



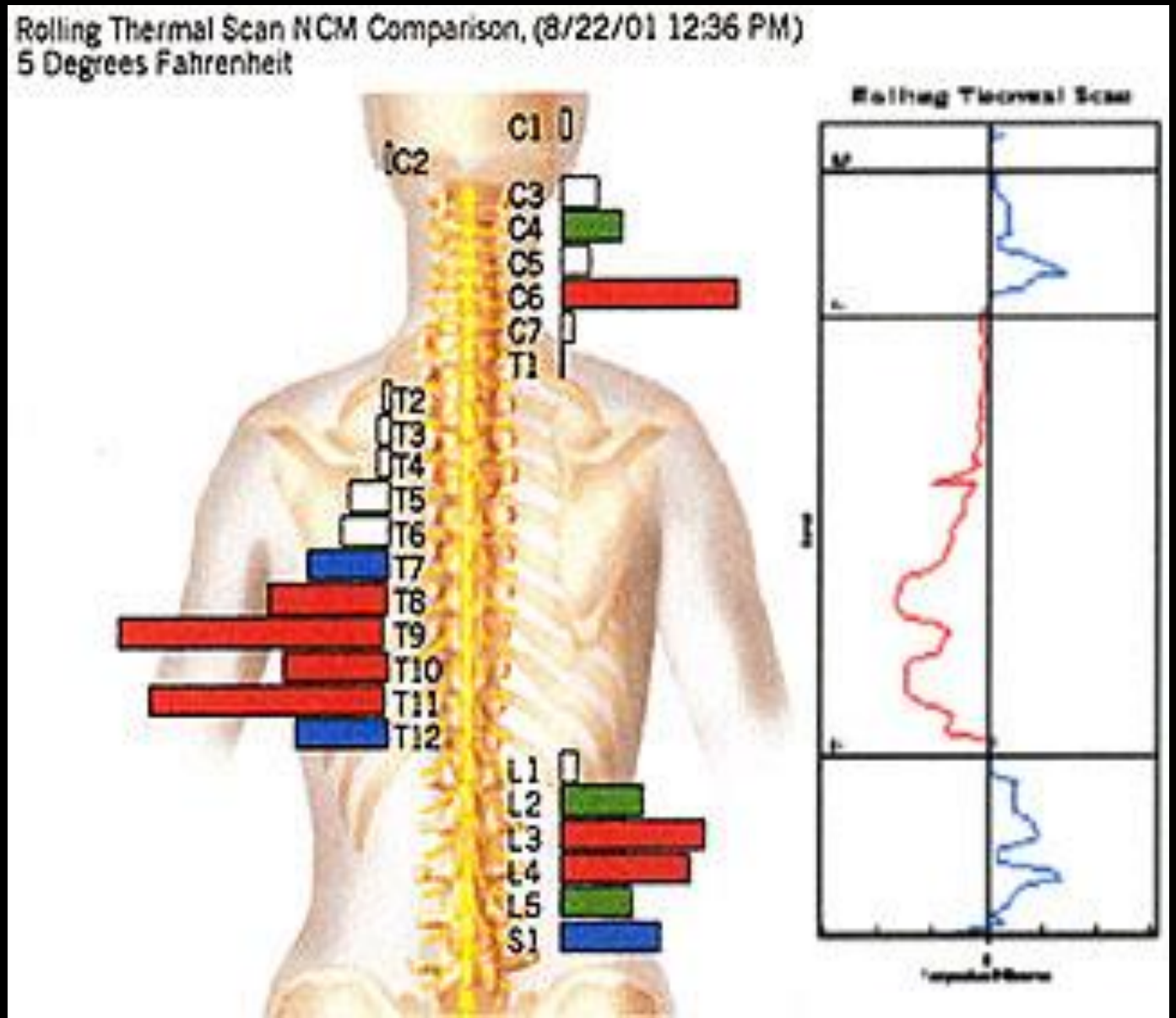
Muscle Function - Normal



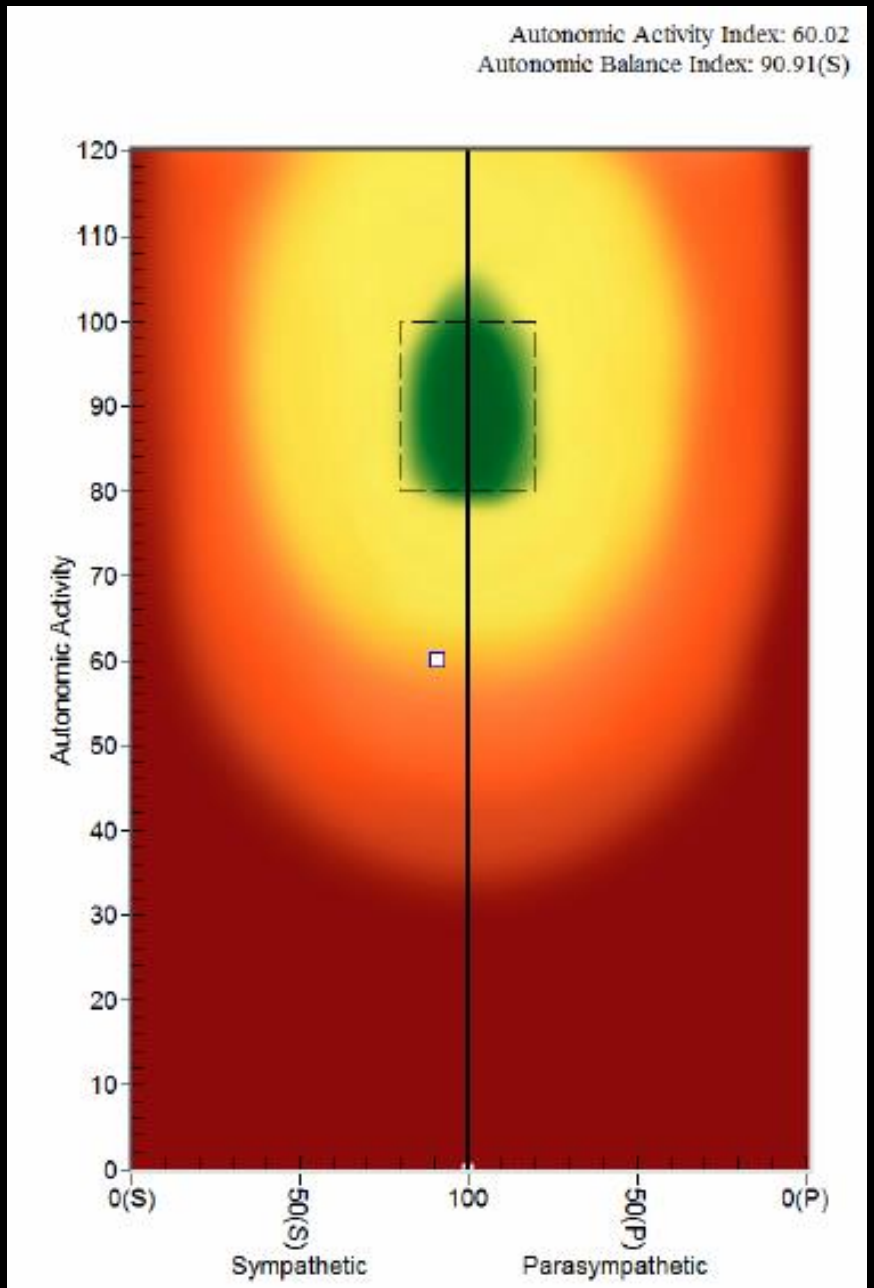
Abnormal - Myopathology



Neuropathophysiology - Abnormal

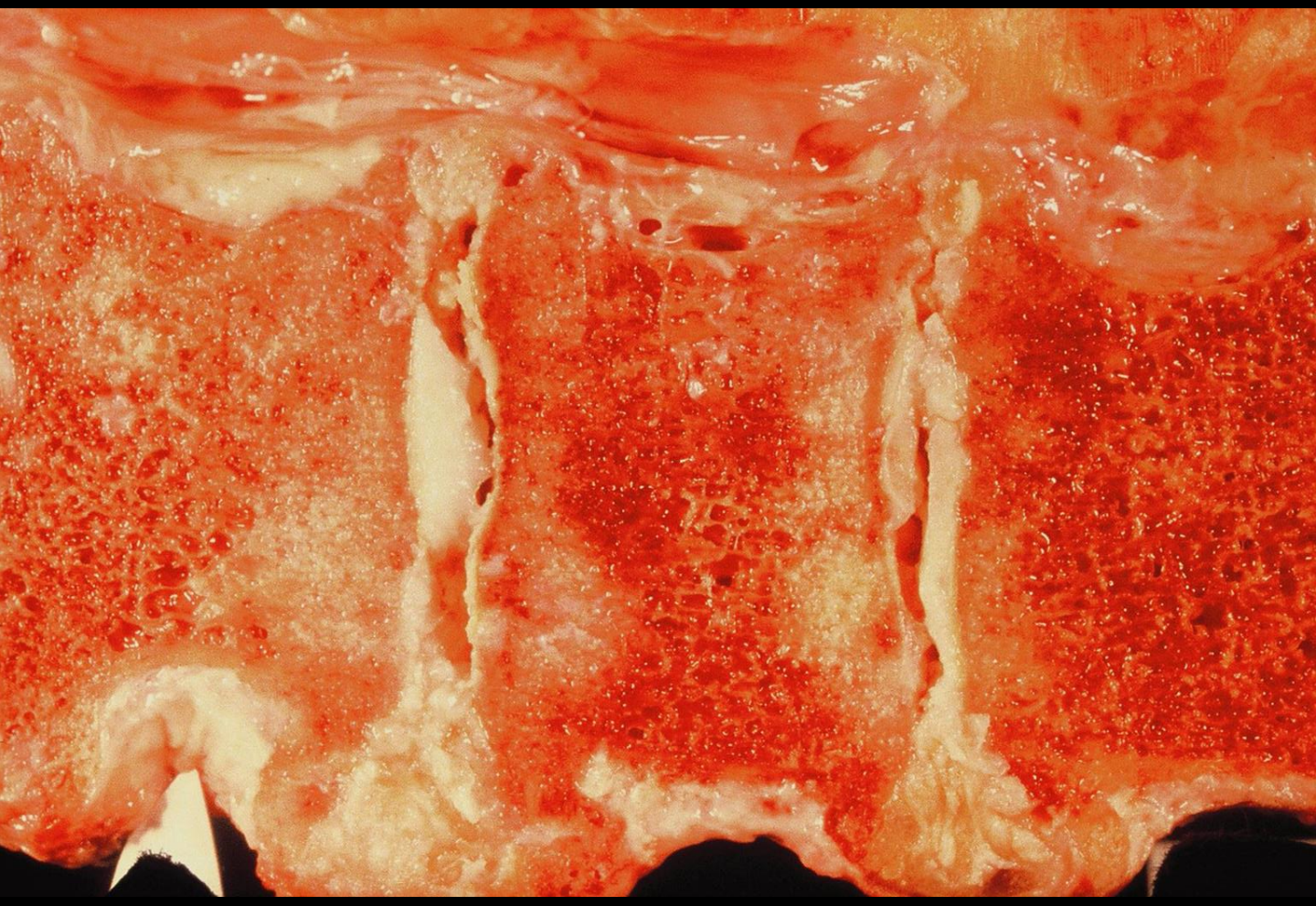


Neuropathophysiology – Abnormal - HRV

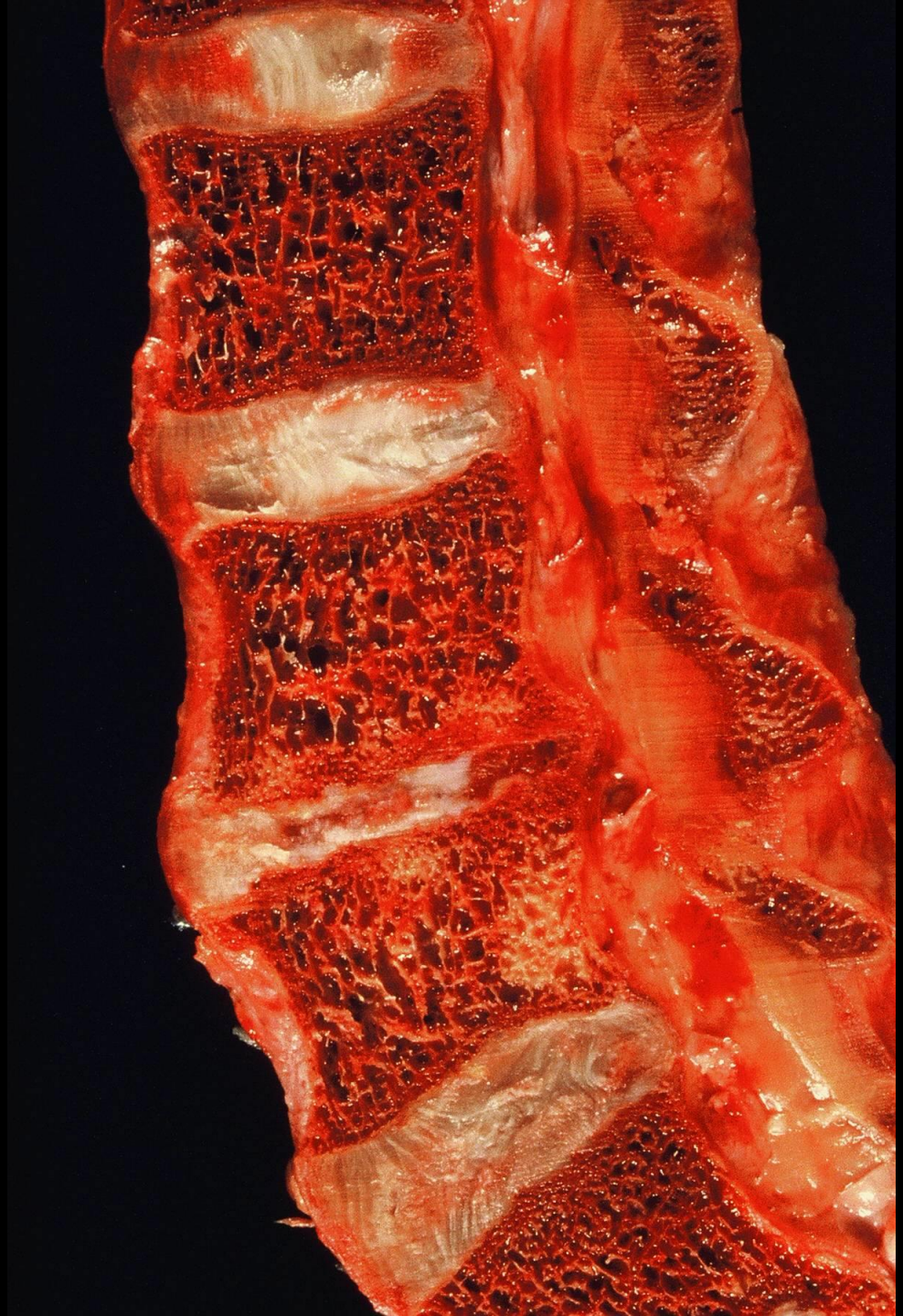




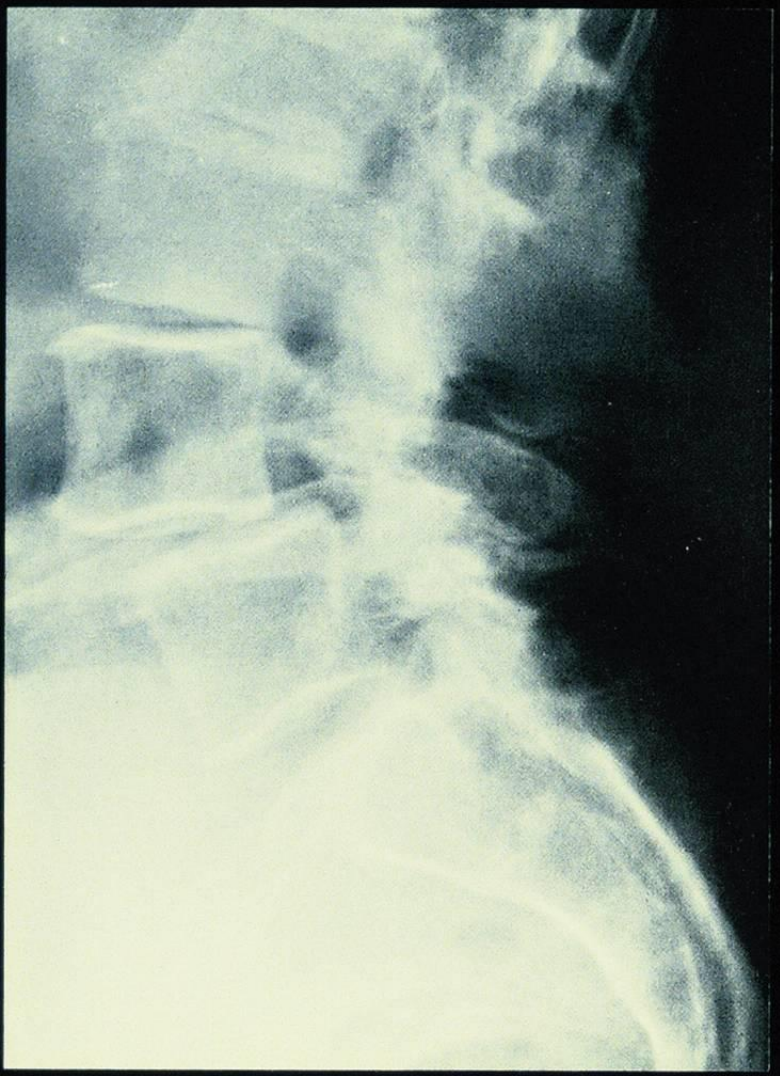


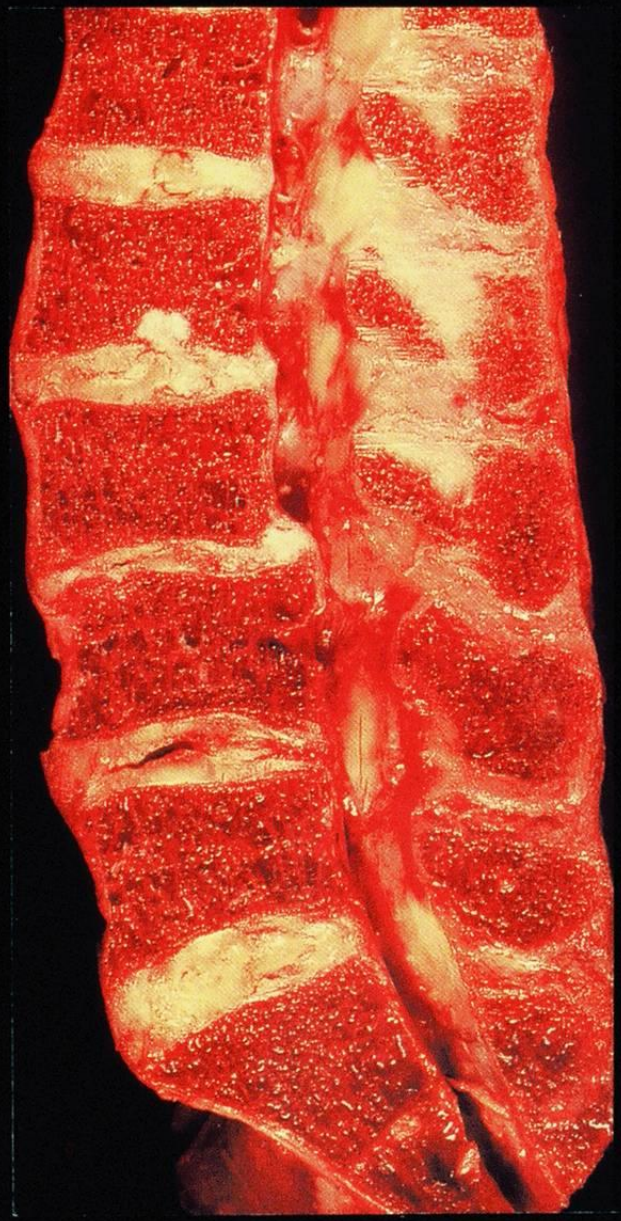




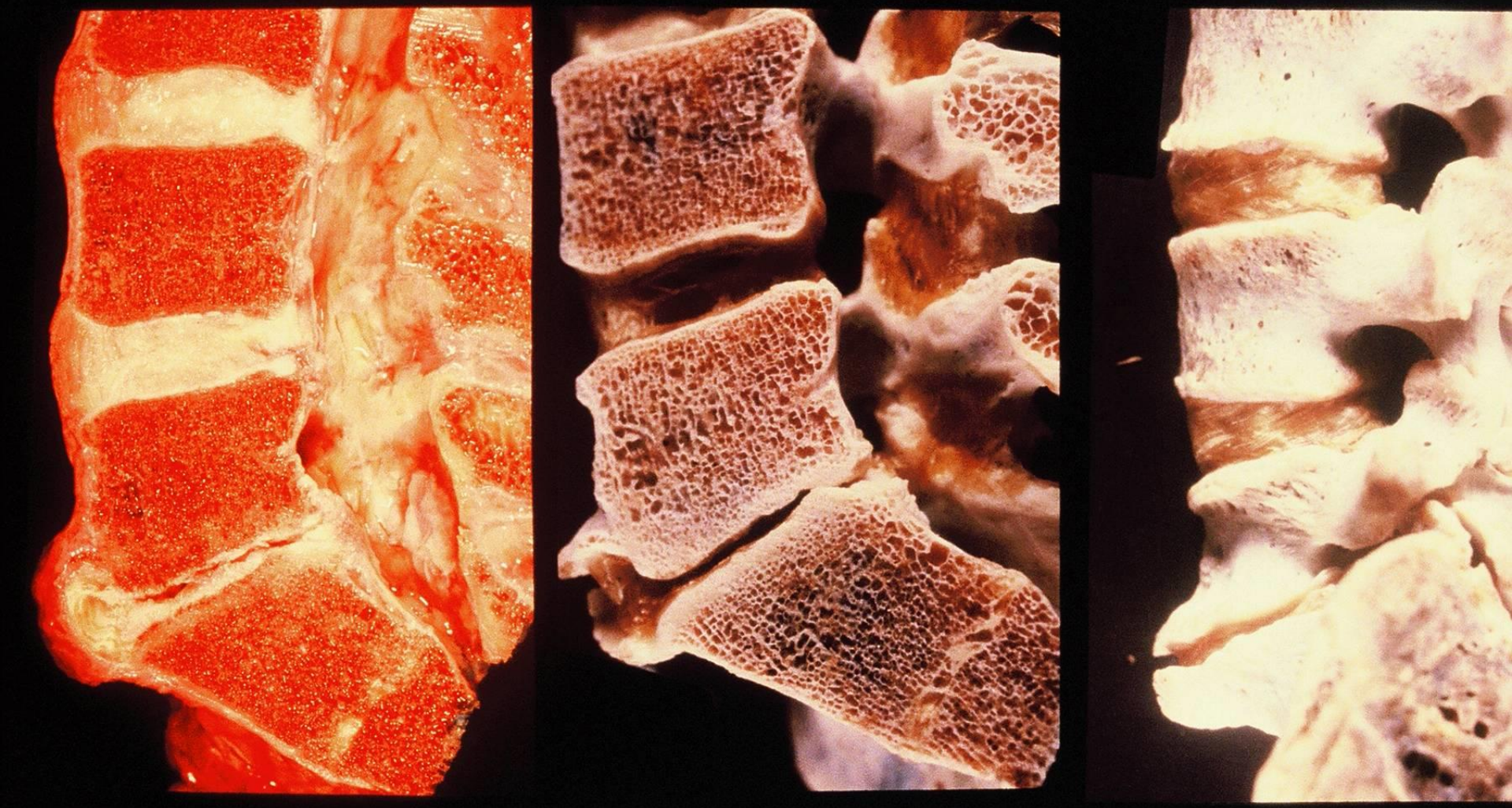


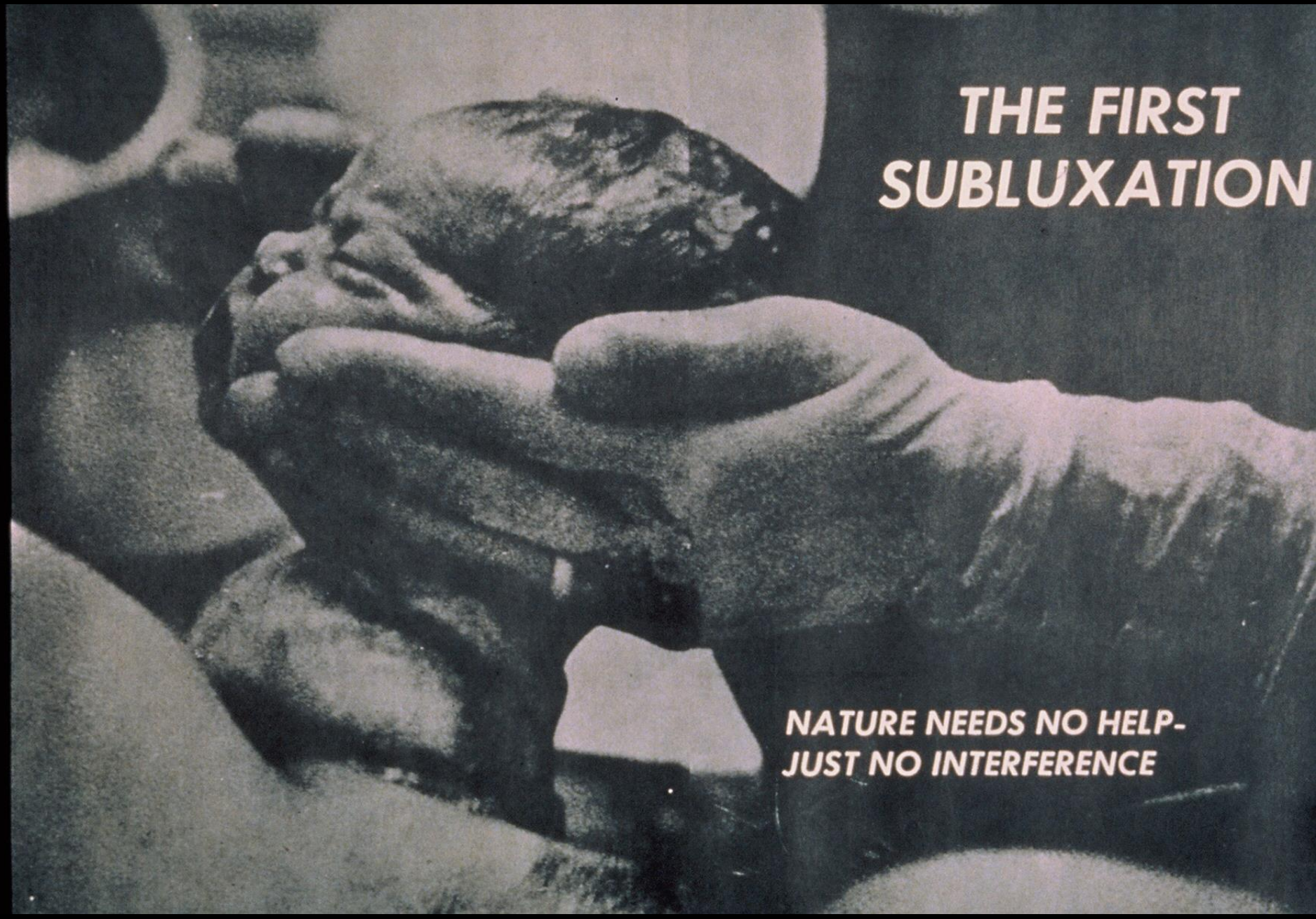




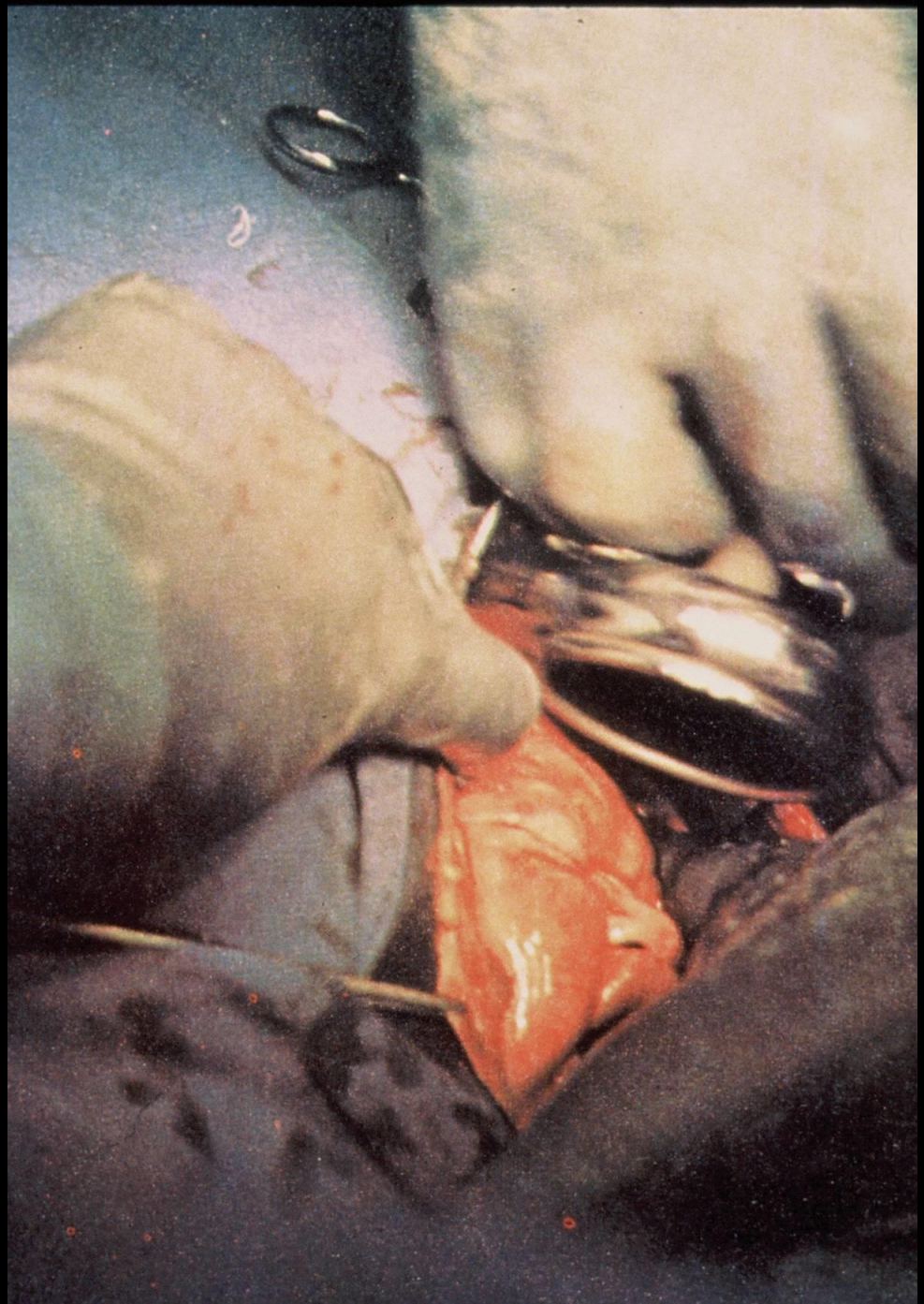


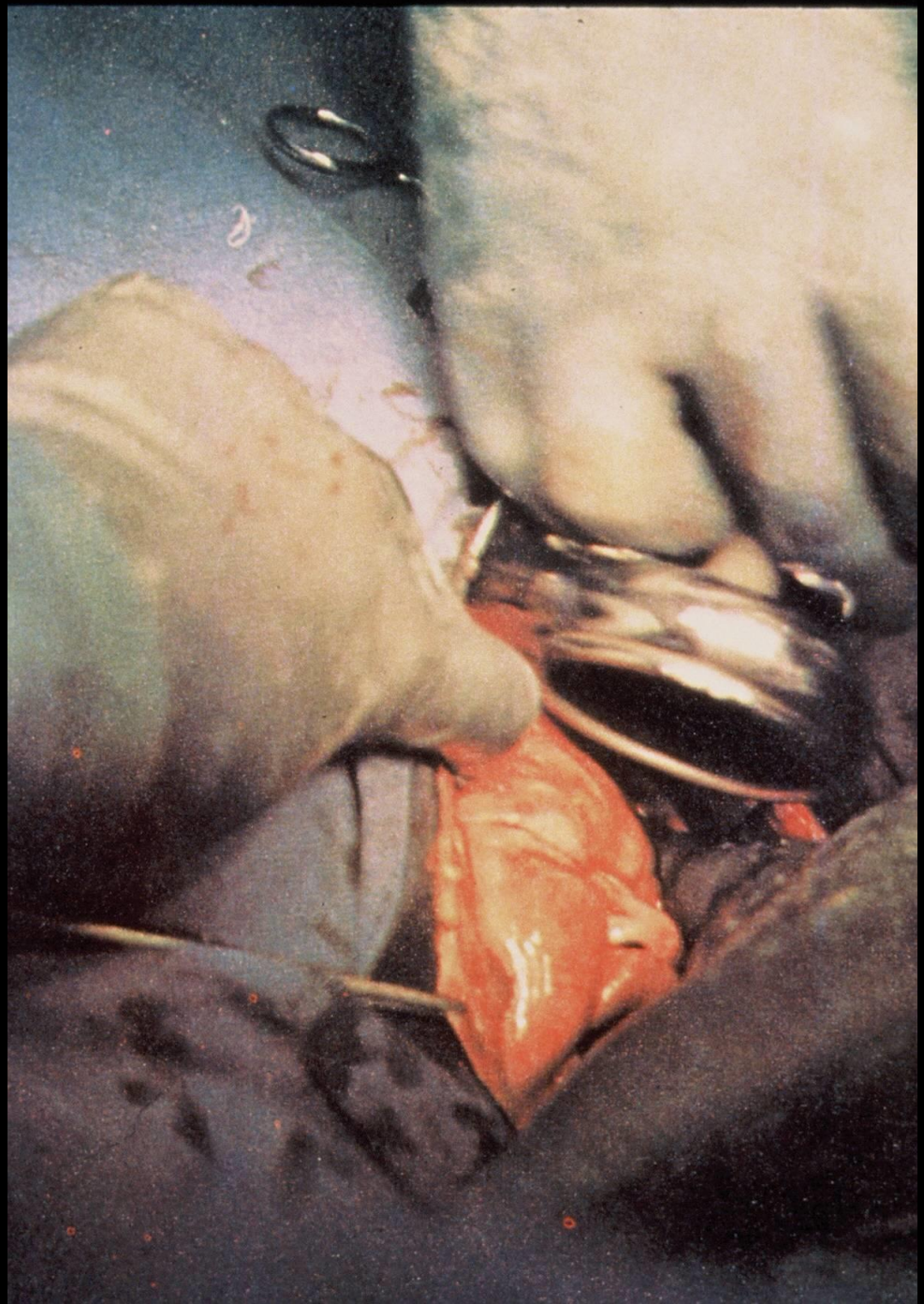


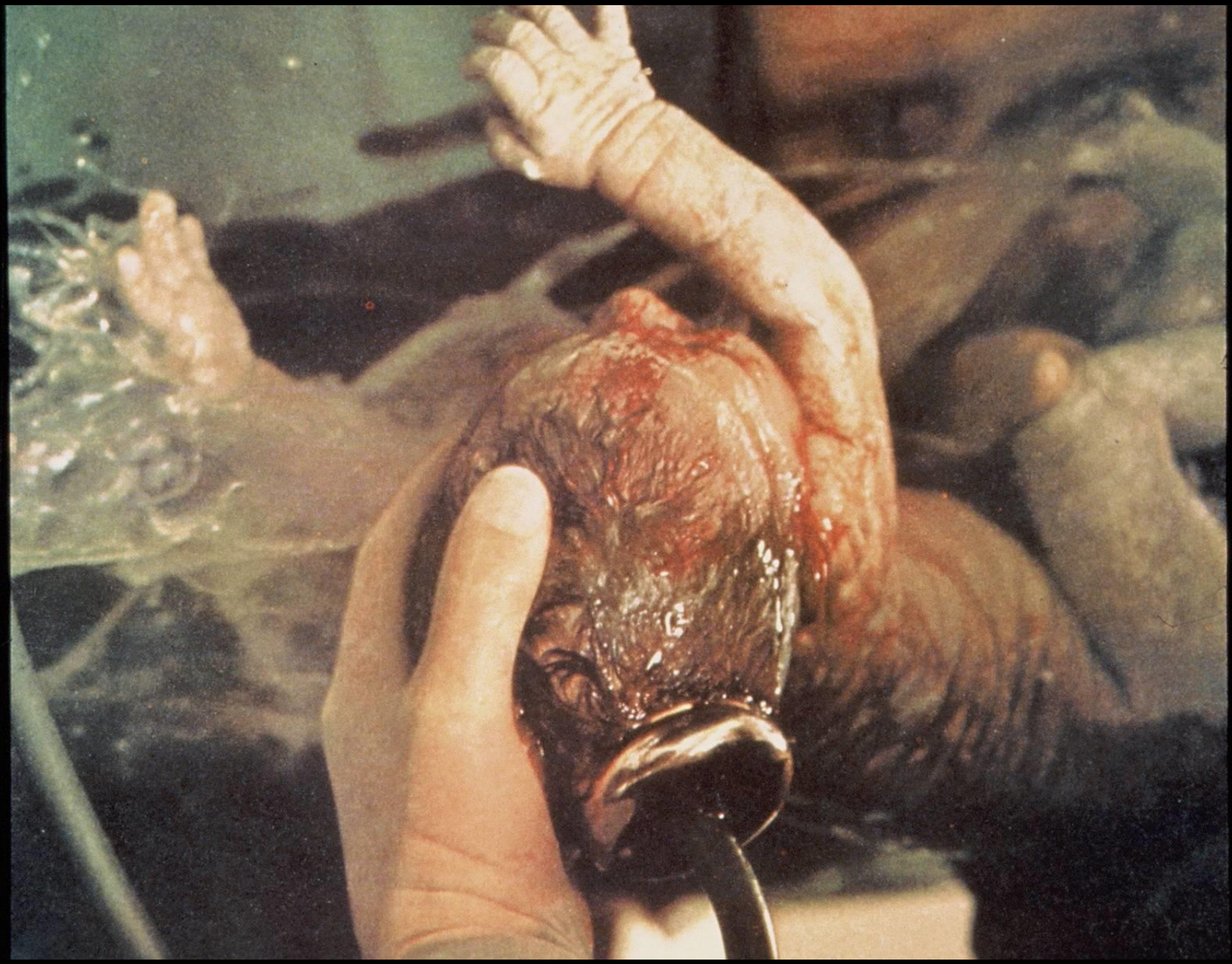



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