



The Chiropractic Vertebral Subluxation Part 8: Terminology, Definitions, and Historicity From 1966 to 1980

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ABSTRACT

Objective: The purpose of this paper is to review and discuss the history of chiropractic vertebral subluxation (CVS) between the years 1966 and 1980, with an emphasis on consensus models and terminology.

Discussion: The consensus models on CVS during this time were an outgrowth of previous model building, research, and practice methods. The first consensus models were developed by the radiology diplomates of the American Chiropractic Board of Radiology. Later work was used to develop Medicare standards. Research and theory were influenced by the 1975 National Institutes of Health conference on spinal manipulation in 1975 and the workshops that followed that meeting. A new historical consciousness about the CVS, developed at the National Institutes of Health conference, which was a turning point for the profession in the use of terminology and the focus on functional pathophysiology associated with CVS. The historical view of CVS developed by Watkins, Haldeman, and Janse led to new integrative and historical developments in the profession.

Conclusion: Theories during this period included consensus efforts as well as new distinctions about CVS theory and terminology. (J Chiropr Humanit 2018;25C:114-129)

Key Indexing Terms: *Chiropractic; History*

INTRODUCTION

The period from 1966 to 1980 in chiropractic was shaped by social, legal, and political pressures, such as the inclusion of chiropractic vertebral subluxation (CVS) in Medicare, federal recognition of the Council on Chiropractic Education, attacks on the chiropractic profession in the United States from the American Medical Association, and the global impact on chiropractic from the New Zealand Royal Commission report.¹⁻³ All of these pressures were involved in a renewed push in the profession to research, validate, and model CVS. Efforts included the first consensus definitions of CVS,⁴⁻⁷ new historical consciousness about CVS,⁸⁻¹⁰ and the conference on Spinal Manipulative Therapy (SMT) hosted by the National Institute of Neurological and Communicative Disorders and Stroke (NINCDS) at the National Institutes of Health (NIH),¹¹ which Taylor et al referred to as “a conference which helped establish chiropractic as a legitimate health care profession worthy of scientific investigation.”¹²

Definitions and discussions of semantics moved into the foreground during this period. Even though CVS theory was at a new height of ubiquity in the profession, especially in terms of the inclusion of complex models of neurophysiology, segments of the profession began to explore new terminology. Joseph Howe’s work provides an example of the changes in terminology at this time. He was a researcher and theorist at the forefront of defining the CVS in the 1960s and 1970s and proposed moving the profession away from the term *subluxation* as the profession’s identity and towards the term *manual therapy*.¹³⁻¹⁶ The purpose of this article is to describe the history of CVS theory during this period and discuss these events.

DISCUSSION

Consensus Definitions (1966-1973)

Three important definitions of CVS were developed between 1966 and 1973. The first was developed by leading radiologists in the profession, the second was at a conference in Houston to address the Medicare law that required subluxation to be diagnosed with x-ray analysis, and the third was a statement developed by the American Chiropractic Association (ACA) Committee on Standardization of Principles, which was started in 1965.

The American College of Chiropractic Roentgenologists formed in 1958.¹⁶ At a meeting in November of 1966, faculty members from x-ray departments of North American

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Static or Kinetic Disrelationships between Adjacent Articulating Bones
A. Tilt with disc wedging; rotation with disc torque or both.
B. Limitation of some motions with free excursion in others. (Partial fixation)
C. Limitation of all motions. (Total fixation)
D. Normal neutral position but reversed motion in some directions. (Paradoxical)
E. Normal neutral position and normal at ALL extremes but with erratic, jumpy motion between positions. (Usually symptomatic)

Fig 1. Types of chiropractic vertebral subluxation as viewed on x-ray and Cine as described by the American College of Chiropractic Roentgenologists in 1966.

chiropractic colleges met with the members of the American College of Chiropractic Roentgenologists board. At the meeting, slides and movies of spinal dyskinesias were studied and several definitions of CVS were summarized. New subluxation terminology was decided upon.¹⁷ R.J. Watkins published a roentgenological brief, titled “Subluxation Terminology” to explain their consensus.¹⁷ At this meeting, the CVS was viewed as a static or kinetic disrelationship between the articular surfaces based on 4 types: total fixation, partial fixation, the hypermobility CVS, and CVS of a joint (not a bone) at the vertebral motion segment. The definition differentiated CVS into a mechanical element and the neurologic consequences. These were described separately because only the static mechanical element could be viewed with x-ray analysis (Fig 1).

Neurologic consequences were defined as a neuropathy, or a neurologic dysfunction leading to a dystrophy. This definition relied on Speransky’s dystrophic model, which was central to Canadian Memorial Chiropractic College’s (CMCC) textbook, *Segmental Neuropathy*, of which R.J. Watkins was a co-author.¹⁸ The dystrophic process included paresthesias, altered reflexes, and slowed impulse transmission, all of which modified the quality (not quantity) of the nerve impulse. Watkins wrote, “The classic chiropractic definition of a subluxation can be better stated as an

‘intervertebral subluxation with consequent neuropathy.’”¹⁷ This included 3 types of CVS: 1 with neuropathy, 1 with minor muscle imbalance but no neuropathy, and 1 as a consequence of neuropathy, which was thought to lead to a complex chain of neuropathies (Fig 2).⁶ Several detection methodologies were recommended, including x-ray listings. The listings included identification of rotation, lateral tilt, flexion, and extension. In addition, muscle and motion palpation, pressure tests, trial adjustments, and neurologic evaluation were recommended.⁶

In 1972, the American Board of the National Council of Chiropractic Roentgenologists of the ACA held a conference in Houston, Texas. They established a radiologic definition of subluxation for the new Medicare standards. The CVS was defined as, “the alteration of the normal dynamics, anatomical or physiological relationship of contiguous structures.”⁶ The definition followed the American Chiropractic Board of Radiology definition from 1966 and differentiated the mechanical CVS from the neurophysiological effects.⁶

In July 1965, the ACA announced that “five of the most respected educators in the chiropractic profession met at ACA headquarters.”¹⁹ They worked for 5 days to craft a treatise on chiropractic. The announcement said, “No greater nor more important work was ever undertaken. After 70 years of progress, research, and clinical experience, the time has come

3 Combinations of Subluxation
1. Subluxation – minor muscle imbalance with no consequent neuropathy, (These usually clear quickly and easily – no vasodilation failure.).
2. Subluxation with consequent neuropathy (Classic chiropractic specialty.).
3. Subluxation as a symptom of neuropathy (Local or remote.) This type of subluxation as a symptom can initiate further neuropathies to become a complex chain.

Fig 2. Types of chiropractic vertebral subluxation by the American College of Chiropractic Roentgenologists in 1966.

that the basis of chiropractic should be re-evaluated and qualified in the light of present knowledge.”¹⁹ This Committee on Standardization of Chiropractic Principles included Bittner, president of the Chiropractic Institute of New York; Harper, president of Texas Chiropractic College; Homewood, president of CMCC; Janse, president of National Chiropractic College (NCC); and Weiant, dean of Chiropractic Institute of New York. A paper was published in 1973. A 2-paragraph section was titled, “Subluxation—A Clinical Entity.” They wrote:

The mechanical lesion referred to by chiropractors as a subluxation is an attending complication of those mechanical, chemical, and/or psychic environmental irritations of the nervous system, which in the biped man produce muscle contraction sufficient to cause articular dysfunction. Once produced, the lesion becomes a focus of sustained pathological irritation. It irritates proprioceptors in the articular capsules, ligaments, tendons, and muscles of the involved segment. A barrage of impulses streams into the spinal cord, where internuncials receive them and relay them to motor pathways for conduction to muscles and glands, initially in excessive amounts. The contraction, which originated the subluxation is thereby reinforced, thus perpetuating both the subluxation and the pathological process which it engenders.

Not all the irritation originates in the proprioceptors, however. The microtrauma attending the vertebral subluxation sets off an inflammatory reaction with edema, which tends to encroach upon the portion of the spinal nerve contained within the intervertebral foramen; the process may even terminate in foraminal adhesions. Still, more extensive encroachments occur upon the foraminal contents (soft tissues, nerve trunk, and other neural elements) in the presence of developmental defects, congenital anomalies, osseous asymmetries, and degenerative and proliferative changes. With the contributory factor of the subluxation, such complications may trigger a full-fledged syndrome of severe root compression or irritation. The fact that a substantial majority of the spinal nerves pass through movable foramina makes such contingencies by no means rare.⁷

Their theory was consistent with the works of the Palmers,^{20,21} Stephenson,²² Verner,²³ Illi,²⁴ Gillet,²⁵ Homewood,²⁶ Watkins,⁶ and Harper.²⁷

Subluxation Models and Terminology From 1970 to 1977

The models between 1970 and 1977 included information from papers presented at the NINCDS conference and a follow-up workshop in October 1977. Papers were presented at the workshop by Hadleman, Gitelman, Jenness, Korr and other scientists, osteopaths, and medical doctors.²⁸ This period

included the publication of an influential 1975 talk by Howe at NCC and the publication of Janse’s collection of essays.^{15,29}

The NINCDS Conference (1975). The NINCDS conference was recommended by members of the United States Congress because of pressure from the chiropractic profession and politicians who supported chiropractic.³⁰ Two million dollars were allocated through the Department of Health, Education, and Welfare in 1974 for NINCDS to hold the conference known as The Research Status of Spinal Manipulative Therapy. The topic was changed from a conference focusing on chiropractic to a broader focus on SMT. Wardwell, a sociologist who studied the chiropractic profession, wrote, “Switching the focus of the conference from ‘chiropractic’ to ‘spinal and manipulative therapy’ was a stroke of genius.”³⁰ This maneuver opened up invitations to a wider spectrum of researchers, including medical doctors and osteopaths. During his talk, Wardwell coined the acronym “SMT” for spinal manipulative therapy to model the osteopaths’ “OMT” (osteopathic manipulative therapy).^{30,31}

The conference included 58 participants. Eleven chiropractic researchers and educators participated, including Janse, Howe, Gitelman, Drum, Jenness, Haldeman, Kent, and Kleynhans (Fig 3). The conference highlighted several CVS models.¹¹ Researchers included individuals, such as Korr, Denslow, Cyriax, Mennell, Sharpless, Suh, White, and Panjabi.

Murray Goldstein was director of the extramural activities program at NINCDS at the NIH. He chaired the conference and edited the published proceedings. Goldstein offered a word of caution at the start of the *NINCDS Monograph*.¹¹ He



Fig 3. Christopher Kent.

observed that even though chiropractic was largely based on empirical and clinical evidence, such evidence should not get in the way of ethical clinical practice. He cited the Hippocratic Oath, which largely guides medical treatment for things like the common cold, cancer, hypertension, and back pain. The inferential evidence for chiropractic, rather than experimental evidence, did not disqualify the formation of hypotheses. Clinical application is the final arbiter of efficacy.¹¹

Goldstein concluded that “the pathophysiologic role of subluxation as a cause or concomitant of organic disease” was not presented at the conference¹¹ and that the focus was subluxation in relation to back pain. In his NINCDS address, Goldstein did not cite any of the decades of clinical research the chiropractic profession had already engaged in, and so his assessment should be contextualized, especially in terms of the future research trajectory. And yet, within some of the presentations, CVS theories of viscerosomatic reflexes and pathophysiology were described.¹¹

The Pathophysiologic Role of CVS at NINCDS. Haldeman’s paper presented at the conference suggested that the CVS was “not considered a single entity.”³² Haldeman differentiated the term as a skeletal disorder with no reference to symptoms or pathophysiology.³² He then used adjectives to classify them as traumatic, inflammatory, postural, psychosomatic, congenital, primary, secondary, compensatory, and according to the symptom as either asymptomatic, compressional, painful, fixated, hypermobile, or irritable, which included visceral reflex abnormalities. Haldeman described x-ray analysis and clinical procedures, such as palpation and instrumentation, for determining CVS.³²

Other papers at the conference described CVS as “a small fragment of radio-translucent tissue-cartilage” as part of a dynamic motor unit,³³ which causes neurovascular irritation and contributes to patho hemodynamics in relation to skin temperature patterns.^{34,35} French hypothesized that CVS could mechanically compress nerve roots and lead to further exacerbation and visceromotor alteration.³⁶ Sunderland suggested that narrowing of an intervertebral disc leads to CVS and a decreased diameter of the intervertebral foramina encroaching on the nerve.³⁷

Suh noted that the main distinction between a medical subluxation and a chiropractic subluxation is the inclusion of neurophysiological disturbances in the definition. This suggested that CVS had a living character that could not be understood by cadaver models.³⁸

Back Pain Hypothesis. In the context of CVS and back pain Goldstein concludes, “Thus, subluxation remains a hypothesis yet to be evaluated experimentally.”¹¹ His emphasis was that chiropractors should continue to address CVS due to the overwhelming inferential evidence and from there continue to build an experimental database of evidence.

Manipulative Therapy Terminology. The 1975 NIH conference was a turning point for terminology, moving away from the chiropractic profession’s traditional emphasis on abnormal functioning owing to an irritated nervous system and toward

definitions related to the term *SMT*. The conference on spinal and manipulative therapy officially emphasized this terminology and its relation to low back pain¹¹ although it included several papers describing pathophysiological disturbances.^{11,33-38} The conference was also a new meeting ground for an expanded neurologic research model.³⁸

The conference changed the research landscape for chiropractic and the way the profession used its terminology. According to Masarsky and Todres-Masarsky, during the 1960s and 1970s chiropractic was moving away from discussion of CVS in relation to internal disease to better fit in with orthodox medicine.³⁹ They proposed that the NINCDS conference was a turning point when the profession’s focus turned to biomechanical problems, with an emphasis on back pain. According to Vear, this shift was because pain syndromes were easier to document, which made it easier to obtain research grants.⁴⁰

There was a movement to define the profession based on “manipulative therapy,” which may have been inspired by the need to distinguish chiropractic’s role in the new Medicare law and the need to integrate research findings across disciplines.¹⁵ In the follow-up workshop on the neurobiologic basis of SMT, Goldstein writes:

A classical but as yet ‘unproven’ approach to the maintenance of health and the treatment of disease is that described under the broad term manipulation or manipulative therapy. This clinical approach is more than a collection of techniques since it is said to intervene in pathophysiologic processes. Specifically what those processes are and in what ways manipulation might be efficacious remain in the realm of hypothesis. However, fundamental research in neurobiology offers the best promise for the solution of this riddle.²⁸

Howe’s Model (1970-1976). Joseph Howe was a 1952 Palmer School of Chiropractic graduate. In 1959, he became the eighth diplomate of the American Chiropractic Board of Radiology.¹⁶ In 1960, Janse asked Howe to take over teaching post-graduate courses in roentgenology at NCC. Howe taught seminars at Lincoln Chiropractic College and NCC. His main research in the 1960s was conducted at the Associates Diagnostic and Research Center, which became an off-campus residency facility for NCC. Howe helped develop the definition of CVS drafted by the Diplomates of the American Chiropractic Board of Radiology (DACBR) in 1966 and at the Houston Conference in 1972, along with R.J. Watkins.¹⁶ In 1978, Howe became chair of the radiology department at Los Angeles Chiropractic College.¹⁶ In 2016, he was awarded the prestigious Lee-Homewood Heritage Award by the Association for the History of Chiropractic.⁴¹

Howe’s Cineroentgenological Studies of the Spinal Column (1970). With a grant from the ACA and the Foundation for Chiropractic Education and Research, the Associates Diagnostic and Research Center conducted a series of cineroentgenology studies that led to new breakthroughs in the understanding of functional spinal movement. These studies

of 100 patients built upon earlier studies conducted by Higley et al at Lincoln Chiropractic College in the 1960's.^{13,42-44} There was obvious influence of R.J. Watkins' previous theories. For example, Howe included a personal communication with Watkins in his reference list.¹³ He also cites Watkins' paper on upper cervical mechanics because Howe demonstrated the same clinical findings.^{13,45} He writes:

Watkins (26) has described erratic motions and reversal of a movement of the occ/C-1 and C-1/C-2 motor units during flexion. These, we find to be frequent. Sometimes this appears to be a strictly adaptive movement to spare loading from anterior movement of the weight of the head to diseased or malfunctioning lower cervical structures. Other times it appears without apparent problems in the lower neck. This remains a fascinating area which needs much more study. We have observed and recorded dramatic changes in this erratic or reversed motion after adjusting, particularly with proprioceptive reflex techniques.¹³

In 1980, Watkins referred to this as the "reversal subluxation."⁶ This was viewed as a musculoskeletal transducer of dysregulation of local motor control. Howe's tentative summary of findings was that radiographs were inconclusive for malposition, but movement studies demonstrated hypomobility, hypermobility, erratic movement, and reversal motion, even with vertebra that appear aligned (Fig 4). He stressed the importance of motion and muscle palpation. Howe also made a finding that was "considerable"¹³; the dominant motion at the motor unit for lateral flexion is rotation, and "while in rotation – lateral flexion

dominates."¹³ He felt this was an important finding when modifying adjusting methods. Other findings included less motion than expected in lumbar facets, which opposed the literature of the day and that intervertebral motion at the thoracic region is less than it is in other regions of the spine.¹³ Howe concluded that "dysfunction" was a better description of the classic CVS because of the variations of mobility in the lumbar, thoracic, and cervical spines and also that it covers a broader range of conditions.¹³

Howe's Radiological Classification (1975). Howe's paper presented at the NINCDS conference in February 1975 focused on radiological findings.¹⁴ Building on the ACA definition, which emphasized the alteration of normal dynamics and the physiological and anatomic relationships of contiguous articulations, he viewed CVS as a functional derangement. He noted that it is often accompanied by articular pathology. He proposed that CVS may cause abnormal physiological and neuromusculoskeletal responses in body systems.¹⁴ Howe proposed a radiological classification system that included sectional, paravertebral, static, and kinetic intersegmental subluxations (Fig 5).¹⁴ He noted that x-ray analysis was only 1 method of detection, and because of the functional nature of CVS, he suggested that it was not as reliable as other clinical methods.¹⁴

Howe's Linguistic Maneuver to Terminology (1976). In December 1975, Howe expanded his concept of CVS. He delivered a talk at NCC as a part of The Seminar on Chiropractic. He published the talk as a 3-page paper in the *Journal of the ACA*.¹⁵ He set the course for the new way CVS was to be described by much of the profession. His talk was based in part on the Houston conference, which I propose was a reaction to the Medicare inclusion of chiropractic being limited to CVS correction. Howe reasoned that insurance

Howe's Summary of Findings in 1970 (quoted/paraphrased)
1. The cervical region – has many possibilities for articular dysfunction – best viewed with motion studies.
2. Lateral flexion – rotation at the individual motor unit is the dominant motion. Rotation – lateral flexion dominates.
3. Lumbar facet motions are less than expected.
4. Intervertebral motion in the thoracic units appears to be less than in any other spinal area.
5. The intervertebral subluxation is a demonstrable entity in cineroentgenographic studies.
6. Lack of intervertebral motoricity in thoracic and lumbar – makes dysfunction and pathology important. Relative hypermobility of cervical region diminishes the significance of misalignment.
7. Mechanism of sacroiliac motion or lack of – needs further study.

Fig 4. Howe's summary of cineroentgenological studies of the spinal column.

companies will base coverage on the limitations of Medicare and that was unacceptable for the profession. It appeared that the aim of the talk was to minimize the centrality of CVS within chiropractic.¹⁵

Howe built upon the momentum from the NINCDs conference by emphasizing the term *manipulative therapy* as the core of chiropractic, not CVS. He dismissed D.D. Palmer's insights as limited, then described the focus on CVS with terms like "inertia," "inbreeding," and professional "isolation."¹⁵ Howe acknowledged the vast literature from theorists, such as Carver, Janse, Nimmo, B.J. Palmer, Kimmel, Haldeman, Hayes, Homewood, Harper, Levine, Beatty, Mears, and R.J. Watkins.¹⁵ However, rather than explain that they were exploring CVS, he suggested that they were looking at "possible explanations for the effectiveness of manipulative therapy."¹⁵ He did not deny they looked at CVS, but he did not say they did. He appeared to use language to prevent the chiropractic profession from being limited to "correction of subluxation,"¹⁵ as was used in the Medicare definition.

Howe's Definition (1976). Howe acknowledged the historical challenges of the profession and emphasized the need for research. He concluded that CVS is a complex phenomenon rather than a specific entity. He writes:

An anatomically demonstrable articular disrelationship, a physiological articular dysfunction, a neurological aberration from proprioceptive insult secondary to either of these, a noxious neuromuscular reflex, a viscerosomatic or somatovisceral aberration, a psycho-

somatic or somatopsychic phenomenon might all be classified under the large umbrella of subluxation by our definition.¹⁵

Howe suggested that the broadness of this definition should not be the limit of chiropractic.

Janse's Subluxation Model (1976). Joseph Janse had an important role in chiropractic accreditation and professionalization as president of NCC and as an early leader of the Council on Chiropractic Education, which earned him the designation of "the apostle of chiropractic education."⁴⁶ Janse conducted cadaver studies with Illi in the 1940s⁴⁷ and x-ray studies with Fox in 1956,²⁹ in which they described lumbar CVS in greater than two-thirds of the 500 cases with low back pain (Fig 6).²⁹ He published on psychogenic disturbances and reflex CVS.^{48,49} The textbook by Janse et al was reprinted in 1978 (Fig 7), which was based on Forster's text from 1915.^{50,51} In 1976, a collection of Janse's essays were published under the title *J. Janse Principles and Practice of Chiropractic*.²⁹ Some of the essays were from the 1940s and 1950s. Much of the book included chiropractic and physical therapy practice. One chapter was a combination of previously unpublished material along with a 1963 essay called "Chiropractic Concepts and Methods."²⁹

In the chapter titled, "Basic Concepts of Chiropractic Theory,"²⁹ Janse referred to subluxation as a primary form of mechanical distortion and as an orthodysarthric lesion. He proposed that CVS may lead to alteration in the intervertebral foramina, causing pressure, irritation, impingement,

Type	Manifestation
Static intersegmental subluxations	1. Flexion malposition 2. Extension malposition 3. Lateral flexion malposition (right or left) 4. Rotational malposition (right or left) 5. Anterolisthesis (Spondylolisthesis) 6. Retrolisthesis 7. Lateralisthesis 8. Altered interosseous spacing (decreased or increased) 9. Osseous foraminal encroachments
Kinetic intersegmental subluxations	1. Hypomobility (fixation subluxation) 2. Hypermobility (loosened vertebral-motor-unit) 3. Aberrant motion
Sectional subluxations	1. Scoliosis and/or alteration of curves secondary to musculature imbalance 2. Scoliosis and/or alteration of curves secondary to structural asymmetries 3. Decompensation of adaptational curvatures 4. Abnormalities of motion
Paravertebral subluxations	1. Costovertebral and costotransverse disrelationships 2. Sacroiliac subluxations

Fig 5. Howe's radiological classification.

traction of the spinal nerves, and spinosomatic-spinovisceral neurologic syndromes. He acknowledged the strain of ligaments, contracted muscles, and postural and nerve tensions. The main causes of this were listed as gravitation, trauma, defects, and the perpetuation by neurologic disturbance. He also described dozens of aspects of CVS like discomfort, pain, traction, torque, edema, neurologic insult, microscopic ligamentous tears, nerve root pressure, and spinovisceral syndromes. By adding this to his earlier writings on reflex CVS from the 1940s,⁴⁸ I propose that Janse was a CVS theorist.^{29,46,50}

Histories of CVS (1968-1975)

A trend of historicity in CVS emerged during this time. This was apparent in 3 papers: Watkin's *Subluxation*

Terminology Since 1746,⁸ Haldeman and Hammerich's *The Evolution of Neurology and the Concept of Chiropractic*,⁹ and Janse's paper at NINCDS, where he presented a history of chiropractic concepts and terminology.¹⁰ This new approach demonstrated a historical awareness that influenced the next period of CVS theories. Watkins,⁸ Haldeman,⁹ and Janse¹⁰ developed historical perspectives and integrated those with the latest theories and neurologic models.

Watkins' Terminology (1968). R.J Watkins started his history with a definition of subluxation by Hieronymus from 1746, along with other historical definitions, and described D.D. Palmer's concept of CVS as a functional response in the nervous system owing to the structural articular disrelationship. He suggested that if nerves are stretched, impulses are modified because of pressure on the sensory nerves of the

Conclusions	Subluxation findings from 500 cases with low back pain
Female to Male Ratio	• 50%
General Explanations	• Most cases were lumbosacral or 5th lumbar involvement • Bilateral Sciatic – 2% • Unilateral Sciatic – 3% • Majority of 500 cases were 5th lumbar with at least one of the following: - Superior sacral facet rotating into the fifth lumbar foramen due to reverse rotation with sacrum - Thinning and compression of disc between the fifth lumbar and sacrum - Approximation of the transverse processes of the 5th lumbar against the sacral horns
Interpretation of the findings of subluxation	• Fifth Lumbar Subluxations: 348 on the anteroposterior views and 307 on the lateral views • Fourth Lumbar Subluxations: 369 with evidence on lateral views
Approximation of 5th lumbar to Sacral Horns	• 323 cases showed some degree either bilateral or unilateral
Sacralization	• 73 either unilateral or bilateral
Spondylolisthesis or Anterior Displacement	• 176 showed this line anterior of the promontory of the sacrum
Contracted Psoas	• 235 unilateral or bilateral
Anterior Gravitational Weight Line	• 176 showed this line anterior of the promontory of the sacrum
Lumbosacral disc thinning	• 314 cases of the 5th lumbar and sacral (which is the only one examined)
Weight-bearing and traumatic narrowing and cupping of bodies of vertebrae	• 278 cases exhibited this pathology
Wrong facet facing	• 124 showed bilateral or unilateral lumbosacral sagittal facing
Narrowing of the Ischio-trochanteric space	• 123 portrayed this distortion
Posterior deviation of the pelvis	• 215 out of 300 cases revealed posterior inclination

Fig 6. Janse's summary of subluxation findings on 500 cases.

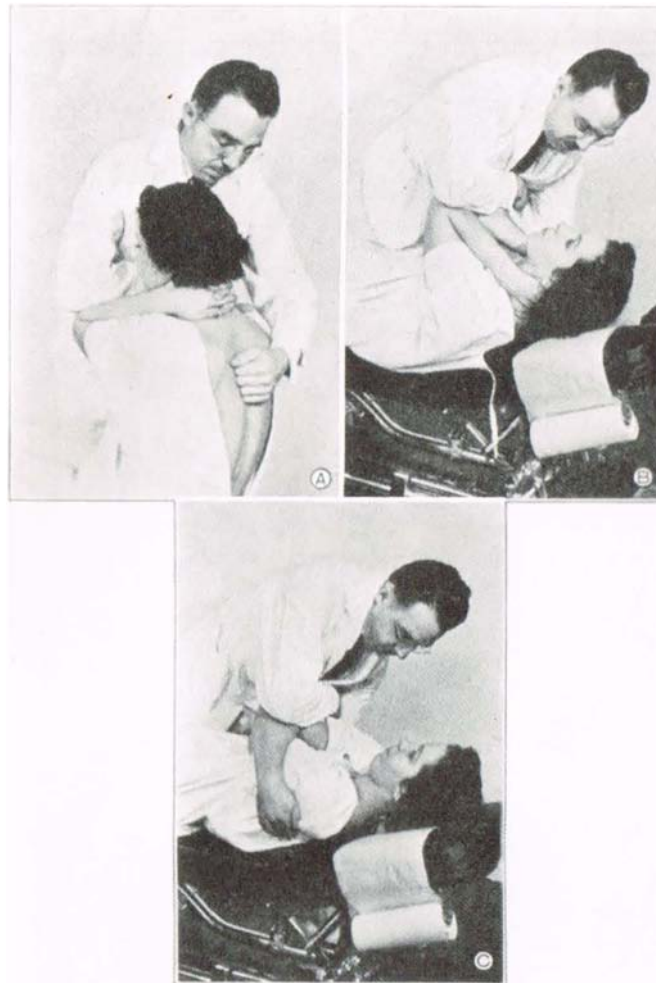


FIG. 86—Thoracic anterior technic—
A.—Contact against subluxated area.
B.—Adjustment of upper dorsal vertebrae. C.—Adjustment of lower dorsal vertebrae.

Fig 7. Janse demonstrating anterior thoracic adjustment in a 1978 reprint of the 1947 textbook.

joint, the afferent cell bodies in the dorsal nerve root ganglia, and, to a lesser extent, on the nerve trunks. Watkins critiqued mistakes he observed in the profession and the overuse of terms like *pinched nerve* and *stepping on a hose*, which were both related to earlier compression theories. He described the highlights of the previous 50 years of chiropractic theory from Smith's ligatite to Gillet's fixation.⁶

According to Watkins, D.D. Palmer's concept that "subluxation of any articulation in the body could initiate a neurologic dysfunction" had fallen into disrepute.⁶ This particular comment was likely aimed at B.J. Palmer's restricted approach to upper cervical subluxation developed in the 1930s. After resigning his position at CMCC in 1968, Watkins ran a cineroentgenology consulting practice owned by Armstrong in Guelph, Ontario.⁶ Reviewing motion studies led him to suggest a new category: the reversal CVS.⁶ He proposed that it was neither fixated nor

malpositioned, but moved erratically because of a disturbance of reciprocal innervation. He concluded that this was due to distortion of the local sensorial conversational tone (Fig 8), which was a concept described in *Segmental Neuropathy*.¹⁸ The input signal of the proprioceptive nerves of the joint becomes a complex "buzz," and the segment becomes "detuned," leading to "fragmentary disintegration." Thus he proposed that no 2 CVSs or their correction were the same.⁶ Watkins used the 1966 terminology developed by the American Council of Roentgenologists.⁶

Haldeman and Hammerich's Evolution of Neurology & Chiropractic (1973). Haldeman and Hammerich's 1973 paper started with a history of research and theory about the nervous system from Aristotle to the nineteenth century.⁹ The paper then set the context for D.D. Palmer's theories in the early twentieth century. They also described an evolution of chiropractic theories about the nervous system and CVS.⁹

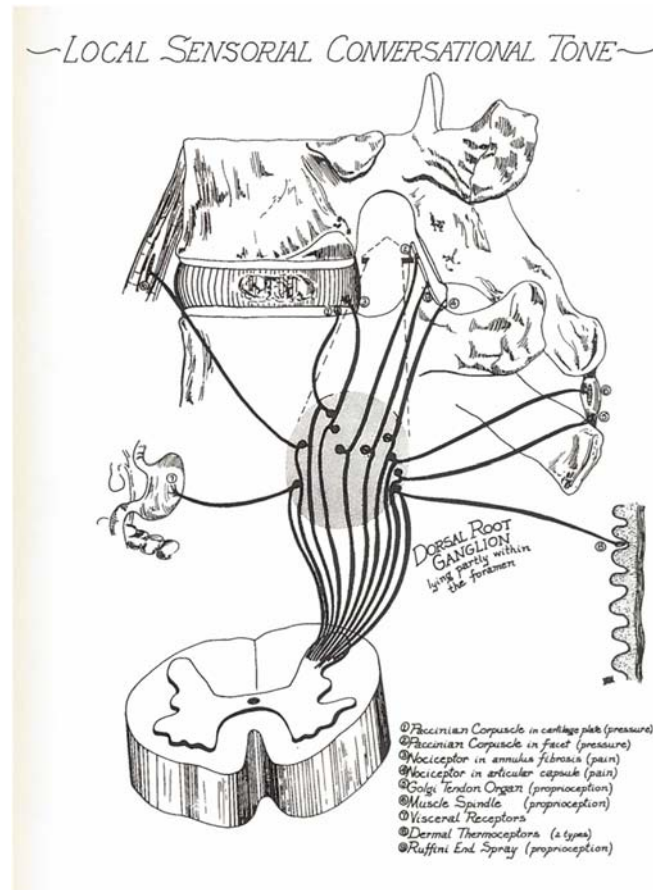


Fig 8. Local sensorial conversational tone from Segmental Neuropathy.

The article captured some of the complexity of chiropractic theory and explored a development of theories apart from the “Palmer Tradition.” These included Janse et al,⁵⁰ Verner,²³ Gillet and Liekens,⁵² Illi,²⁴ Homewood,²⁶ and Harper.²⁷ In citing Janse’s 1947 text, it is possible that they were unaware that the core of the text was from Forster’s 1915 book. In Verner, they found the nonimpinging CVS as the most important concept and a major influence on the Canadian chiropractic models.²³ In their assessment of European researchers, such as Illi and Gillet and Liekens, they suggested that the European’s emphasis on biomechanics and not pathophysiological mechanisms helped them to avoid criticism but offered no real new insight into how chiropractic results were obtained.^{24,52} They concluded that Homewood’s book was objective, but Harper’s book had “gone to extremes in trying to explain the entire function of the body in terms of these reflexes.”^{9,26,27} The article cited Haldeman and Drum’s 1971 paper, which converted the chiropractic concepts of “mental impulse,” “nerve force,” and “nerve pressure” to electro-chemical impulses and blocked axoplasmic flow.⁵³

Noticeably absent from their comprehensive overview was reference to Watkins’ theories or *Segmental Neuropathy*.^{6,18} Considering that Haldeman conducted research for CMCC on the synchro-therme,⁵⁴ in the author’s opinion, it may have been

an oversight, a dismissal, or political. The Food and Drug Administration blocked all transport of the instrument into the United States as part of the American Medical Association’s crackdown on chiropractic in 1968. The profession was silent on the issue.⁵⁵ The International Chiropractic Association (ICA) did nothing to help Peterson,⁵⁵ which led to Himes’ resignation from the association and perhaps CMCC’s distancing from Peterson and the instrument.⁵⁶

Finally, Haldeman and Hammerich wrote of the historical phenomenon of chiropractors who rejected both the chiropractic philosophy and chiropractic practice, many of whom were osteopaths, naturopaths, and homeopaths. They write:

Perhaps the most damaging school of thought which arose among DCs [doctors of chiropractic] at this time was the concept that chiropractic included all forms of therapy which might be helpful to a patient, stopping just short of major surgery and pharmacologic medicine.⁹

They contrasted this approach with the early chiropractic ideas that the adjustment could cure anything. They concluded that this school of thought erroneously defined chiropractic based on doing anything and that both approaches had severe limitations.⁹

Historical Errors in the Haldeman and Hammerich Paper. I propose that there may be several errors in Haldeman and Hammerich's description of the Palmers' early chiropractic theories.⁹ It is not uncommon for papers from this era to contain historical errors because it is only recently that our knowledge about D.D. Palmer's life has increased tenfold.⁵⁷⁻⁶² However, I feel that it is important to point out errors because these papers were influential. For example, Janse may have cited or paraphrased some of these mistakes in his plenary address at the NINCDS conference, which was referenced decades later.^{2,10,30,63-65}

Haldeman and Hammerich stated that D.D. Palmer was educated in the 1860s, which they suggested accounted for his vibrational theory of nerve impulses.⁹ I believe that they were partly right in this assessment. We know that Palmer was primarily self-taught after 1864, when he left Canada and completed his schooling from a "brutish country taskmaster" named John Black.⁶⁶ According to Gaucher-Peslherbe et al, Palmer read the literature dating back 200 years and used the scientific texts of his day, especially anatomy, physiology, and surgery texts.⁶⁷ However, based on the available evidence, D.D. Palmer's studies of physiology and anatomy did not begin until the 1890s, and his vibrational theories were not developed until 1909.⁶⁸⁻⁷²

Haldeman and Hammerich suggested that Stephenson invented the safety pin cycle.⁹ They write, "R. W. Stephenson, who, in 1926, developed the so-called 'safety pin cycle,' which is not very far removed from the concept of the reflex arc." However, it was B.J. Palmer who first proposed the simple cycle in 1907⁷³ and further developed the concept in 1909,⁷⁴ which was later summarized and made popular by Stephenson in 1927.²² It was referred to as the "safety pin cycle" because of B.J. Palmer's original drawing.⁷⁴

Haldeman and Hammerich stated that D.D. Palmer did not engage in specific adjusting and that B.J. Palmer's development of the meric system was not developed from D.D. Palmer's methods. They write:

B.J. Palmer tried to move from the very general techniques of adjusting that his father used to a more specific type of adjustment. He tried to find a specific adjustment, which would be more effective than a generalized thrust. This led to the development of the meric system of adjustment based on the anatomical exit of nerves, which supplied various organs. He then, however, tried to find one spot on the spine, which would be the key to all disease. He settled on the atlas and axis region.⁹

The meric system was developed from D.D. Palmer's original method of nerve tracing, which was his very specific form of assessment tracing tender or inflamed nerves from vertebra to organ or symptom.^{62,75} D.D. Palmer wrote, "The Paris doctors give the back bone a general overhauling, very similar to the Osteopaths, whereas I adjust only one vertebra, making the adjustment direct and specific."²⁰ I suggest that

the meric system was developed by B.J. Palmer and presented in *Volume 4*⁷⁶ as an analysis system and not an adjusting system. B.J. Palmer was not searching for one spot on the spine. It is possible that 1 source of this error may have come from B.J. Palmer's 1961 memoir, which they reference.⁷⁷ B.J. Palmer wrote that book in a teleologic style, as if history was leading to a point of development, one that emphasized his contributions. The development of upper-cervical analysis developed from clinical research. He claimed that he used thermographic instrumentation for about 7 years, starting in 1923, and then determined that "true" subluxations could only occur in the upper cervical spine. This conclusion was based on the hypothesis that the 3 directional movement and the spinal cord tension caused by that movement correlated to the abnormal patterns of thermographic activity.^{78,79} According to B.J. Palmer, this system was an evolution from the meric system but was largely based on his empirical observations using thermography.^{21,80-82}

Haldeman and Hammerich did not mention B.J. Palmer's other contributions to CVS theory, such as the development of his early models of interference and cord pressures,^{73,74} which I consider to be an error of omission. Instead, they focused on his upper cervical approach from the 1930s, which is a more common reference for B.J. Palmer's life and work.

I feel that they overstated their case about the divides within the profession. They referenced the works of Janse and Verner to support their position that the 2 took a more scientific approach to research than Carver from the Carver Chiropractic College and Blodgett from the Universal Chiropractic College. They write:

Those schools of thought that rejected the vitalistic philosophy but retained the spinal adjustment as the basis of chiropractic treatment. These men included J. Janse and J. R. Verner. They were relatively well read in the current textbook knowledge of neurophysiology and accepted most of the current concepts of neurophysiology. They no longer spoke of nerve force or innate intelligence, but still felt that the nervous system was the primary controlling system in the body and any interference with the normal transmission of nervous impulses would result in disease or dysfunction.⁹

They cited Janse's 1947 text, which used the terms *nerve-force* and *central governing intelligence*. Verner's text used "nerve energy" in relation to neurologic interference. Thus, I propose that they mistakenly linked theories from Janse and Verner to nonvitalistic and neurologic approaches and theories from Carver, the Palmers, and their students to vitalistic and nerve force models. Such distinctions were not black and white. Most theorists from this time shared these core hypotheses, and most were exploring the latest neurologic models. For example, Blodgett's predecessor at the Universal Chiropractic College, Joy Loban, authored a text on neurology

that was favorably reviewed in the medical literature.^{83,84} This particular passage could have exacerbated misperceptions about the pervasiveness of the chiropractic paradigm within the profession.

These errors point to the limited historical knowledge about early chiropractic theories during this period. We now have better access to historical documents and more historical literature that has developed since 1975. This access allows us to spot possible errors and speculate on how they may have impacted the discipline of CVS theory. I proposed that these errors impacted the literature.^{2,30,63-65} For example, some were paraphrased in Janse's address at the NINCDS conference and thus published in the proceedings.^{10,11}

Janse's Chiropractic Terminology (1975). Janse's history was delivered at the NINCDS conference. The 8-page paper contained 505 references with a glossary from "A to S," or from "adjustment" to "subluxation."¹⁰ He started his article with the same 2 quotes as Haldeman and Hammerich to capture D.D. Palmer's theories of health as tone and CVS as a cause of tension leading to increased or decreased vibration. Janse equated homeostasis with tone. He concluded that D.D. Palmer's theory of increase or decrease of vibration was a crude explanation of facilitation of inhibition and the role of lowered tissue resistance in relation to disease vulnerability.¹⁰ His paper explored several hypotheses: nerve compression, proprioceptive insult, somatosympathetic reflex, viscerosomatic reflex, somato-somatic reflex, and somatopsychic and neurodystrophic processes.¹⁰

Janse included the development of biomechanical concepts, adjusting concepts, analysis and instrumentation, and adjunctive procedures.¹⁰ He limited the neurodystrophic hypothesis to "the important role of the nervous system in the control of immunogenesis,"¹⁰ rather than general pathophysiology, which was how Speransky coined the term.⁸⁵

This last point is interesting in light of the obituary of Janse, where Phillips and Triano write, "Janse was a major influence in turning the profession away from a monocausal belief in the origin of disease."⁸⁶ Speransky's theory was that a noxious insult to the central nervous system could lead to a wide spectrum of neurodystrophic processes associated with pathophysiology leading to "all the forms of local pathological processes known to us."⁸⁵ Speransky writes:

The dystrophic process arising within the nervous system is capable sometimes of subsiding completely without leaving lasting traces behind it. Sometimes, however, it is preserved in a latent form, and then the application of any new stimulus may call it into life. In the peripheral tissues, there will be a reproduction of the reaction, corresponding in dimensions and form to the process which had already taken place there. We may encounter in this way vascular phenomena (oedema), or inflammatory phenomena (ceratitis), destructions (noma, gangrene, ulcer), new formations (papillomata), that is to say, in the final analysis, *all the*

forms of local pathological processes known to us. Acquaintance with this category of phenomena turns upside down all the old conceptions of the genesis of local pathological processes, shatters a number of the notions created by cellular pathology, and casts doubt on the actual value of classifying diseases according to the organs and systems of the body.⁸⁵

By leaving out the fullness of Speransky's theory and how chiropractors of the past used it as proof of the chiropractic paradigm,^{6,18,23,26,27,81,87,88} I suggest that Janse's interpretation of chiropractic terminology was limited.

NEW PERSPECTIVES, DEFINITIONS, AND COMPLEXES

I propose that the linguistic distinctions in the chiropractic profession between 1966 and 1980 had at least 4 impacts on the profession and the use of subluxation. The first was the expansion of the neuropathic perspective into most CVS theories. The next was the move away from subluxation terminology and towards manipulative terminology. This is highlighted in the proceedings of the NIH conference, the follow-up workshop, Howe's 1975 address to NCC, and the 1979 ICA conference on the principles and practice of chiropractic.^{11,15,28,89} The other impacts include the development of Objective Straight Chiropractic (OSC) by Reggie Gold and the vertebral subluxation complex (VSC) developed by John L. Faye.^{90,91} These distinctions may have helped to reify opposing positions within the profession mostly around diagnosis while further differentiating the CVS terminology.

The Neuropathic Perspective

Central to these approaches was that the CVS was defined across the profession in terms of the articular dysfunction and associated neurologic dysfunctions leading to various abnormal states or neuropathy. In 1966, the DACBRs defined it as, "Intervertebral subluxation with consequent neuropathy."¹⁷

This period was characterized by a neuropathic perspective, which integrated many of the previous theories, including the proprioceptive, reflex, stress, neurodystrophic, biomechanical, and instrumentation influenced models. Ultimately, the concept of the irritated nervous system, reflexively functioning abnormally as a component to articular disrelationships of the spine, goes back to D.D. Palmer.²⁰ Proprioceptive models can be traced to Stephenson and Heintze.^{22,92} Ideas from Heintze and D.D. Palmer influenced Verner, who had a strong impact on this new neuropathic perspective.²³ Haldeman and Hammerich described the importance of Verner's theory of the "non-impinging" CVS.^{9,23} They write:

Verner went to great lengths; to discuss the neurophysiological concepts of his time and felt that cord or nerve root compression could not adequately explain all the results obtained by the chiropractic adjustment. He felt

that the “non-impinging” subluxation was important... This concept greatly enlarged the chiropractic thinking and influenced especially the Canadian chiropractic concept of disease.⁹

Verner’s influence can thus be extended to many of the definitions of this time period. For example, the Canadian school of thought includes the works of Muller,⁹³ Homewood,²⁶ and CMCC’s *Segmental Neuropathy*¹⁸ in addition to later subluxation theorists, such as Gitelman and Drum.^{35,94} Also, Watkins, who co-authored the second edition of *Rational Bacteriology* with Verner and Weiant,⁹⁵ helped to craft the influential subluxation definition from the DACBR in 1966.^{6,17} The DACBRs distinguished the mechanical element of CVS from the neurologic consequences.^{6,17} The DACBR definition could be viewed as an integration of the neuropathic perspective into the profession’s discourse. They defined neuropathy as:

NEUROPATHY—“Any neurological dysfunction;” earlier dysfunction than the structurally demonstrable “dystrophy.” This term is now used by scientists generally to imply slowing of the speed of impulse transmission PLUS altered reflexes and paresthesias. This is found consistently in diabetes mellitus, rheumatoid arthritis and increasingly in all the degenerative pathologies. Hence the classic chiropractic definition of a subluxation can be better described as an *intervertebral subluxation with a consequent neuropathy*.¹⁷

The height of CVS research from the previous 4 decades was captured in the definition. Several definitions were modeled after this definition, such as the Houston Conference definition,¹⁶ the ACA definition,^{7,96} and later the ICA definition.⁹⁷

Chiropractic Defined by Manipulative Results

Howe’s presentation at NCC further distanced the profession from the terminology of CVS by suggesting that *subluxation* should not define chiropractic, whereas *manipulative results* should. He expanded on the DACBR definition and defined CVS as “not a specific entity but a complex phenomenon,” and he acknowledged the pervasive proof from myriad fields of research, but he did not feel it should define chiropractic. Howe writes:

Chiropractic, and indeed all manipulative art, is defined not by a concept of a lesion or dysfunction it attempts to correct or modify, but by the results it can obtain. Whether or not a subluxation can be depicted radiographically, or whether or not a viable model of subluxation can be produced so that “hard research” can reduce to numbers the mechanisms by which such an entity can cause problems or be corrected, the fact remains that manipulative therapy gets

results in many of man’s ailments. The sine qua non of chiropractic is manipulative results.¹⁵

He continues:

That subluxation exists is documented by many observers: doctors of chiropractic, osteopathy, medicine, and others, each of whom may have a different concept of what it is. That it, in its several manifestations, may have clinical importance is attested by these observers and others. That its correction or at least its modification can have beneficial results cannot be seriously disputed in light of successful treatment of many conditions by manipulators throughout recorded history. The complex phenomenon of subluxation, therefore, must be a part of chiropractic concern and of any scientific investigation of chiropractic.¹⁵

Howe referenced several papers from the medical literature.⁹⁸⁻¹⁰² He then concluded that chiropractors should not be limited in their ability to diagnose any disease process, “or at least be diagnostically competent to recognize those disease processes they should refer for alternate or concurrent therapy.”¹⁵ In this way, he suggested that chiropractic could be integrated into health care with its unique insight that the ability or inability to adapt to the environment should be how chiropractic measures health.

The perspective that chiropractic should be defined by manipulative therapy was carried forward in the 1979 conference by the ICA. In the preface to the textbook that emerged from the conference, Haldeman writes how chiropractic was equated with SMT and that it was the “largest, most skilled, and best-organized body of health care professionals offering this service.”⁸⁹ He defined SMT as:

All procedures whereby the hands are placed on the spine or paraspinal tissues with the object of improving a patient’s health. Such procedures include the specific spinal adjustment, the non-specific long-lever spinal manipulation, mobilization of the joints of the spine, soft tissue massage, trigger-point manipulation, and manual traction.⁸⁹

During this early stage of terminology change in chiropractic, the adjustment of CVS was defined as only a single aspect of a broader therapeutic terminology called SMT. This approach embraced the Middle Chiropractic Paradigm started by John Howard,^{103,104} founder of National School of Chiropractic. This paradigm included many different modalities and methodologies within the definition of chiropractic. In the preface to Howard’s book, he quoted a passage from Yergin’s article in *Nation’s Health* that translated the Greek roots of the word *chiropractic* to “that science of drugless therapy, which is accompanied by skillful hand treatments.”¹⁰⁴ From this perspective, adjustment of CVS was viewed as essential, but chiropractic also included “every form of hand

treatment requiring scientific and skillful hand application.”¹⁰⁴ This may not have been how D.D. Palmer originally intended this word to be used,²⁰ which opens up a discussion about this modern approach. I suggest that the modern use of the term SMT developed from the need to research and dialogue with other disciplines and scientists and to be inclusive so that insurance reimbursement would not be limited to the Medicare restrictions to CVS.^{11,15,28,89}

Chiropractic Defined by Objective

It is likely that the OSC movement was partly a reaction to the linguistic move away from CVS as the defining characteristic of the profession.^{2,91,105} The movement was centered at Sherman College of Chiropractic. This movement contributed to the development of an alternative accrediting agency for several schools that were solely focused on the analysis and correction of the CVS.¹⁰⁶ Their position was to make CVS the only diagnosis required for chiropractors.^{1,2,107}

The OSC differentiation could be viewed in the same spirit as the DACBR definition. However, this caused an additional split of the CVS into 3 aspects: anatomic, neurologic, and philosophical. The philosophical aspects related to the body's inherent ability to self-organize and self-heal.¹⁰⁸ We might view this as 3 levels of complexity: the anatomic, the neurologic, and the functional organizational levels.

The straight movement did not dismiss the core chiropractic models like the mental impulse.¹⁰⁸ This was different than Haldeman and Drum's conversion of philosophical terms, like nerve force, nerve pressure, and mental impulse, into physiological and chemical reactions and Janse's equation of tone to homeostasis.^{10,53} From the OSC perspective, mental impulse was viewed as analogous to the organizing information conveyed by the nerve and innate intelligence was viewed along the lines of R.W. Stephenson's biological-level definition as the law of organization in living systems.^{22,108,109}

The OSC approach emphasized the mechanical and the neurophysiological elements while further differentiating the CVS from its philosophical roots. They defined innate intelligence by the organization of biological processes and not by the psychospiritual definitions traditionally attributed to it by the Palmers.^{20,108,110} Psychospiritual definitions of Innate were downplayed to focus on the physiological importance of detecting and correcting CVS.⁹¹ From this period forward, CVS could be described in 3 broad categories: mechanically, neurologically, and organizationally.

The Vertebral Subluxation Complex. Leonard J. Faye developed the VSC model in 1967 to teach at Anglo-European Chiropractic College. The VSC model was comprised of 5 components: biomechanical, neurologic, muscular, inflammatory, and the stress response. Faye was inspired to make these differentiations after reading an ACA sponsored article in the 1960s.¹¹¹ This may have been the DACBR definition or an early report of the new ACA

definition. It is possible that Faye, who graduated from CMCC in 1960, was inspired by Homewood, who was president during this time.^{112,113} In his 1962 book, Homewood writes of the CVS in terms of “biochemical, biomechanical, pathophysiological, radiological, subjective, and objective symptoms.”²⁶ Homewood's book may have inspired the DACBR definition as well. After Faye published his course notes in 1983, several developments of his models were integrated into the profession.¹¹⁴⁻¹¹⁶ Faye's subluxation complex became one of the most influential contributions to the subluxation literature after 1980.

By 1980, Harper had died, the Association for the History of Chiropractic was formed, and several new journals emerged that would shape the theoretical and empirical discourse. The *Journal of Manipulative and Physiological Therapeutics* was already 2 years old.² In 1980, important books were published: Haldeman's *Modern Developments in the Principles and Practice of Chiropractic*,⁸⁹ Leach's *Chiropractic Theories*,¹¹⁷ and the second edition of *Who's Who in Chiropractic International*, which included Rehm's *Necrology* and Gibbons's history of chiropractic education.¹¹³ Gibbons and Rehm helped to form the journal *Chiropractic History*, which started in 1981 and fostered the new historical consciousness in the profession.²

Limitations

This paper is based upon a single author's interpretation of the evidence available. Future reviews of the literature should include more systematic methods. Because of the difficulties in obtaining primary sources for this type of research, it is possible that this work is missing some important source documents. It is hoped that future researchers will help to fill in gaps in this literature.

CONCLUSIONS

The time between 1966 and 1980 was pivotal for the development of CVS theory. Consensus models and landmark conferences laid the foundation for the profession. Theory would go into the following 2 primary directions after this time: (1) more profession-wide consensus and model building based on research and the literature, and (2) more attempts to distance the profession from CVS terminology. In 1977, at the close of his talk at the NIH workshop on the neurobiologic mechanisms of manual therapy, Haldeman cautioned theorists and scientists that they should have an open dialog to ensure that their theories were plausible.²⁸ This was not a substitute for empirical research, but it was a valid method of developing theory and one that has been used in the profession throughout its history. Integration of previous theory, reviewing potential historical errors, and clarifying the history of definitions during this time allows new insights to emerge to interpret the literature.

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Practical Applications

- This series of articles provides an interpretation of the history and development of chiropractic vertebral subluxation theories.
- This series aims to assist modern chiropractors to interpret the literature and develop new research plans.

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