

Evidence Informed Vertebral Subluxation – A Diagnostic and Clinical Imperative

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ABSTRACT

This paper utilizes the science, logic, and politics, of the evidence surrounding the premise of the vertebral subluxation (VS), which roundly refutes and negates the assertions made by the subluxation deniers, who have yet to provide evidence that the VS does not exist. Further, their inability to describe the entity that they are treating leaves their arguments totally unsupported and unsubstantiated.

This presentation tracked the nomenclature used to describe the entity that chiropractors treat/manage and discussed the evidence that has evolved to support the now commonly used term of

vertebral subluxation. Of necessity, both clinically and legally there has to be an entity that practitioners identify, diagnose, resolve or manage, and the evolution of the term vertebral subluxation satisfies that requirement as the most appropriate premise based on current clinical and research evidence.

Keywords: *evidence informed, vertebral subluxation, chiropractic*

Introduction

“The birth of the chiropractic movement was not an historical anachronism, but a logical development within the clinical sciences, and particularly the neurological science, of the time.” Gaucher-Peslherbe PL. 1992¹

The clinical finding of a vertebral subluxation and elements thereof have been identified from at least 1746 by various health professions under a range of designations consistent with other biomedical precedents of observations, research and clinical recognition. The chiropractic profession has a distinct history and genesis based on the correction of the vertebral subluxation.²

This discussion presented is based on a recognised neuromusculoskeletal perspective. As a premise, the following definitions are offered for both a spinal and non-spinal subluxation. **Vertebral subluxation** is the abnormal function of one or more of the spinal articulations which may lead to altered neuropathophysiological functions through somatosensory activation.

Subluxation is the abnormal function of one or more of the osseous articulations which may lead to altered neuropathophysiological functions through somatosensory activation.

As summarized in a comprehensive analysis by Senzon, the subluxation is a rational clinical premise supported by the literature as a neuropathophysiological disturbance between contiguous vertebrae which a corrective segmental adjustment seeks to address.³⁻¹²

The subluxation premise would appear to be the most appropriate explanation to date to account for reported vertebrogenic signs and symptoms. Research reports investigating the lesion, recognise a neurovertebral association, as do positive clinical outcomes shown in over 2,000 case reports.¹³⁻¹⁸

Some might challenge the entity, or disagree with its hypothesis, but a premise cannot be dismissed, that would be

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akin to challenging an opinion – the opinion still stands in the face of other opinions. One rational premise is as good as another and even better if there is evidence to support it. The evidence in support of the subluxation has yet to be formally challenged.

Consistent with Bogen's statement, the observed phenomenon of vertebral subluxation is identified as a biological aberration - a clinical finding, particularly when associated with signs and symptoms. It is further confirmed when those signs and symptoms are alleviated with corrective segmental adjustments or focal manipulation.¹⁹

A case is presented for the retention and recognition in the chiropractic lexicon of the term subluxation, or more specifically a vertebral subluxation as an inclusive concept and reflection of the complex nature in the dysfunction.

The subluxation may be justified as being clinically legitimate. *Clinical legitimacy* is noted by Eastwood as being 'validation conferred by clinical effectiveness of a given treatment with or without scientific evidence as to why or how it works.' We argue there is significant scientific and clinical evidence to support the premise. It is also argued that evidence does not necessarily have to be in medical publications when other refereed publications and indexed sources are available.²⁰

These other sources include ten (10) chiropractic journals listed in the PubMed medical index and a further 57 listed in the online Index to Chiropractic Literature. Consequently, there is no excuse for intentionally or unintentionally ignoring the extensive literature on subluxation.²¹⁻²²

The manipulative science of chiropractic provides identifiable reasons in order to introduce and clinically deliver and justify a specific manual therapeutic approach. The legal principle is that it is not reasonable to provide therapeutic intervention in the absence of a diagnosis. Bergman allows an appropriate diagnosis and a prescription for intervention. This then deserves a distinguishing nomenclature for such a clinical finding as the vertebral subluxation.²³⁻²⁴

Over a century of constant recognition and documentation must constitute sufficient grounds to sustain the use of vertebral subluxation in the chiropractic context. The term subluxation has also been used in a similar connotation both in medical literature and by the World Health Organisation and is afforded a coding in ICD-10 - the International Classification of Diseases.²⁵⁻²⁶

Evidence Based Practice

Logic would challenge the assumption that a single profession's model of care is appropriate for governing every health care model and every patient, and must fail when patient preference is considered under the three key proposals put forward in 1996 by Sacket et al. Instead of integration of their three pillars as the basis for evidence-based medicine (EBM), it appears that one pillar – external evidence – now greatly dominates EBM at the expense of the other two – the individual clinical expertise, and the individual patients' predicament, rights and preferences. This model is seen here

as influencing the limited views regarding the vertebral subluxation where patient preference and clinician experience feature strongly. It is suggested that the supporting evidence criteria methodology must vary for chemical (pharmaceutical), clinical, and manual patient care.²⁷

To be constrained by evidence based guidelines for a different model of care seems to run counter to Sacket's intent. Rostris suggests there are limits in being confined by EBM. He feels it tends to limit doctor-patient communications as well as diagnoses and treatment.

Further, he stated that *"Improving patient-physician communication is an area of medicine that deserves greater attention. Narrative medicine can be considered as one tool that can aid in fostering better communication. Current medical practice is dominated by evidence-based medicine, and dictates what therapies the clinician will offer in a given circumstance, ideally supported by (evidence-based) guidelines. However, when taken alone it tends to decentralize the patient.....Moreover, use of narrative-based medicine may be associated with better diagnosis and treatment of pain. Narrative-based medicine is not just for end-of-life care, but something for all caregivers to give greater consideration to in daily practice in order to form a strong frame of alliance."*²⁷⁻²⁸

It would seem quite irrational and contradictory for critics to reject the VS concept when the concept and application of addressing the VS are also adopted into some standard medical practices, particularly in Europe. Medications and procedures are regularly based on empiricism and clinical observations, at least initially, but degrees of positive response support their continued use. The case with off-label prescribing would be an example.

Medical concepts, procedures, and regimens are also evolving conceptual models as they should be. As evidence accumulates, it is now emerging that knee surgery is not necessarily the optimal intervention it was once thought to be, and many medications have been withdrawn from the market due to adverse side effects and ineffectiveness.²⁹⁻³⁵

Miles and colleagues acknowledge the evidence debate has been long-standing. On the theoretical foundations and practical applications and that epistemological, ethical, methodological and clinical debate are a part of an evolving process in EBM, they state

"Thus, clinical interpretations of medical evidence will differ and attempts to select one interpretation over another or to synthesize a third, subsequently declaring it as 'truth' are irresponsible and cannot be recognised as belonging to the scientific ability or methodological competency of any one group of clinical academics or practising clinicians." The essence of this is that all health practices are evolving with recognition in accepting that personalised care shows greater promise.³⁶

It also appears to be quite irrational when the VS is so clinically evident, that it would be unethical if not negligent to deprive patients of the benefit of relief by not recognising the potential effects of the subluxation. Many an innovation has

been based on incidental observation with, penicillin, ether, nitrous oxide, the intraocular lens and vitamin K being classic examples.³⁷

Placebo

There have been claims in the past that the benefits of spinal manipulation are merely a placebo effect. Seeing that most chiropractic patients have already failed previous treatment attempts, such a statement would suggest that any chiropractic placebo effect would be more effective than the previous placebo effect of their previous model of treatment. Such a disavowing stand is taken without being subject to serious comparative efficacy studies making such a hypothetical unjustified, if not bizarre.³⁸⁻³⁹

Logic and Rationale

Whatever term is used, it will require a clarifying definition as associated with all nomenclature. The descriptive terms of 'dysfunction', 'spinal lesion', 'somatic dysfunction' can also be ambiguous if not meaningless without a definition.

To deny the subluxation is to deny that the possibility that a neurospinal factor is contributing to a patient's symptoms. It implies that the patient's positive response is not associated with the vertebral adjustment of that segment. It also implies that biomechanical disruption is not recognised in cervicogenic conditions. This would be in contrast to the 709 papers produced in a PubMed title search of the term cervicogenic.

Those who question the vertebral subluxation are obliged to explain their stand, not just state their denial. There seems to be an absence of alternative hypotheses, an absence of a suitable alternative definition, identifying nomenclature, and an absence of formal evidence and rationale.

Given a choice of an analgesic, anti-inflammatory drugs (including opioids), or a vertebral adjustment, the logic would suggest that a more conservative, far less invasive, and safer biomechanical approach could be a more reasonable option which is more suited for a solution to a biomechanical lesion, and that a chemical drug application might seemingly not address the underlying *physical-mechanical* aspect. While drugs may however ease some resultant symptoms, the more conservative manual measures when indicated should be implemented first to avoid possible drug and surgical side effects.⁴⁰

The focus of a manipulative procedure must target an identified aberrant structure which must be then named to justify initiating a manual intervention. Whether it is called a vertebral subluxation, vertebral dysfunction, vertebral lesion, functional lesion, or a locked vertebra, there is an obligation to identify it by name. There must be a sound legitimate clinical reason for deciding to justify and conduct a manipulative procedure on a particular structure. This entity may comprise mechanical, functional, neurological or structural, clinical signs, or symptom-based findings.

There is no point in manipulating a normally positioned and functioning vertebra which is free of signs and symptoms,

otherwise there is no rationale or justification for carrying out the manipulative procedure. One can hardly expect or justify clinical results of manipulating a normal functioning spine.

It is submitted that there is a significant difference between denying the existence of an *object*, and denying an *hypothesis* which is based on considerable clinical observations. An opinion-based denial without substantiating evidence is hardly a scientific proposition. A theory may be disagreed with, but the rejection of it has a different set of ground rules to confirming the existence or disturbance of a solid 3-dimensional object. It is submitted that the accumulated supporting data is observational, perceptive, rigorous, and clinical empiricism which make the subluxation premise epistemic. It comprises both the observable and the unobservable by utilising physical findings, patient history, symptoms and other methods.

Placebo claims tend to overlook the evidence where placebo factors cannot apply. The classic example of this would be in the manipulative management of infants with cases of colic where the demand from parents for chiropractic management is noted. It is also indicated by evidence in relation to the spinal manipulation of animals with no apparent psychological overlay. This has led to the emergence of veterinary chiropractic.⁴¹⁻⁴⁷

Consistent positive outcomes would suggest that SMT is much more than a placebo. In addition, it is noted that the demand for chiropractic care by politicians, medical doctors, lawyers, top sports stars, as well as high profile members of the public, would suggest the need for positive results are what means most to patients. It may also indicate their preference or desperation when previous care had failed, all of which tends to further negate the placebo theory.⁴⁸⁻⁵²

Professional Identity

All professions have their own lexicons which are accepted for clarity of identification and meaning by other professions. Similarly, patients accept new terms affiliated with the established findings. Reservations regarding the term subluxation are suggested as being opinion founded more from a political base, rather than on sound clinical, scientific, or practical grounds and may represent a form of lexicon cleansing.

The emerging chiropractic profession 120 years ago adopted the term to describe the spinal segmental biomechanical lesion considered by Smith, Langworthy, and Paxson as well as DD Palmer as subluxated vertebrae. For some to claim there is no evidence to substantiate the existence of such a lesion would be fundamentally false and certainly misleading. Such a false claim depends on one's interpretation of the type of evidence referred to. Some may claim that there is not enough evidence, but that misinformed view could be applicable to clinical entities in virtually any health profession, and is an arbitrary, opinion-based statement. A century of clinical evidence alone, not to mention the research, substantiates its acceptance.⁵³⁻⁵⁵

In 1976 Hadley, a senior medical roentgenologist discussed functional elements of the subluxation in some length. We acknowledge that as vertebral subluxations are also deemed to

have both subtle and overt aberrant *functional* and neurological elements, the clinical significance of particular aberrations may not always be demonstrable on static plain film radiography.⁵⁶

While there may not be the level of evidence to satisfy some as to its existence and significance, the clinical indications cannot be ignored. Simply claiming there is no proof of subluxations is dodging the issue. It would seem that those questioning the subluxation have rejected any recognition of a subluxation without acknowledging that it is a reasonable hypothesis tending to explain a noted clinical finding.

No testing of the subluxation hypothesis as a null hypothesis seems to be available. Ebrall's systematic review failed to show any reports of testing the null hypothesis in humans, nor has an alternative hypothesis been forthcoming, something that would have been expected to allow a claim that subluxations do not exist. This is either a turning a blind eye to science, or a resort to political imperatives where a superficial notion of denial is offered that subluxations are unproven.⁵⁷⁻⁵⁸

We suggest that if it was not for the persistence and success of this chiropractic model over many decades, the subluxation may well have waned under more conservative reservations. We note with interest that the subluxation premise under a range of similes has now been gradually adopted by other professions, as the evidence mounts in support of its existence, implications, and clinical value.⁵⁹

We could locate no other clinical finding that does not have an identifying nomenclature. Our study found that there is far more evidence in support of a vertebral subluxation hypothesis but a paucity of contrary evidence. We dismissed unsubstantiated opinion as un scholarly.^{29-30, 60-82}

Subluxation Precedents

While it has been identified under many appellations, vertebral subluxation has been used widely as a readily recognised term over many decades. Its identification as a complex clinical finding dates back to early medicine about 400 BC. Still (1874) and, Palmer (1895) revised and modernised the concept. It has become well recognised, accepted, and understood globally by health professionals and patients. The concept has moved from a mechanical/structural model to a complex AND sophisticated neurophysiological model.⁸³⁻⁸⁷

We consider it is not practical to reproduce in this paper all the existing evidence supporting the subluxation premise. We offer representative sources, and focus our rationale on the neurophysiology of the science.^{3-12, 29-30, 64, 67, 71, 73-74, 88-103}

We suggest that the evidence sustaining the subluxation hypothesis constitutes a scientifically justified, reasonable and rationale foundation supporting a premise for a frequent clinical finding of a neurobiomechanical aberration that may occur to vertebral segments of human or animal spines. We find it difficult to identify the logic and rationale of those who disclaim subluxation in a manner lacking in scholarship expressed as research findings or philosophical argument.^{1,43-45, 104-105}

"Scientists obtain a great deal of the evidence they use by observing natural and experimentally generated objects and effects." Bogen 2017.¹⁹

Hypotheses, Theories, and Premises

The chiropractic practice in identifying a functional spinal lesion associated with mechanical joint pathophysiology, anatomical structures, neurosensory, and other soft tissue structures and physiological disturbances is the vertebral subluxation. Be it hypothetical, historical, or contextual, as well as being clinically relevant, the subluxation as defined by the WHO adequately describes this lesion.¹⁰⁶

Much of medicine is based on theories, concepts and observations, these continue to evolve. There is a plethora of papers published on the relationship between medical theory and medical practice. It seems inconsistent that chiropractic cannot be based on similar criteria. Something as common and fundamental as pain is based on theories with a range of pain theories available.

Black cites Hennekens and Buring when they note *"Observational evidence has provided and will continue to make unique and important contributions to this totality of evidence upon which to support a judgment of proof beyond a reasonable doubt in the evaluation of interventions."*¹⁰⁸⁻¹¹¹

- Alderson explained that theories are a means of considering observations and technical methods of describing these under four key points,
- Theories are integral to healthcare practice, promotion, and research,
- The choice of theory, although often unacknowledged, shapes the way practitioners and researchers collect and interpret evidence,
- Theories range from explicit hypotheses to working models and frameworks of thinking about reality,
- It is scientifically and practically imperative to recognise implicit theories as they may play a powerful influence in the understandings of health care.¹¹²

In essence, it is suggested that the existing theories on the vertebral subluxation contribute to the science behind it rather than detract from it. This is consistent with practices in other professions. In capturing the syntactic, model-theoretic paradigm, Thagard notes the complexity of medical theories and explanations. He states that such theories illuminate *"many aspects of the development and application of medical knowledge."*¹¹³

The title of Malterud's 1993 paper *Medical theories derived from medical practice* would also seem to openly acknowledge the role of hypotheses in practice - *Medical theories derived from medical practice*. Here, there is discussion about the process in the evaluation of competing medical theories. Such a statement indicates that not only are multiple theories accepted for particular aspects of medicine, but conflicting ones may also contribute and stimulate medical science. In 1998, Lewinsohn also examined the science and theories of

medical practice in recognising roles for both elements in medicine.¹¹⁴⁻¹¹⁵

In recognising theories in clinical knowledge, Malterud stated further that *‘Theories of knowledge, especially the concept of tacit knowing, seem suitable for description and discussion of clinical knowledge, commonly denoted “the art of medicine.” A metaposition allows for inquiry of clinical knowledge, inviting an expansion of the traditional medical epistemology, provided that relevant criteria for scientific knowledge within this field are developed and applied.’*¹¹⁶

Some may regard the subluxation as a construct. As with medicine, theoretical constructs can be regarded as legitimate clinical entities deserving of clinical attention. Indeed they contribute research, enhancing theories which all contribute to an understanding of observed phenomena.¹¹⁷

It is suggested here that Sanfilippo’s discussion on theory and practice could also relate directly to this same issue on the subluxation. His rationale merges the clinical, theoretical, and practical application of a diagnosis of vertebral subluxation.

An extract is worth noting:

*“Every discipline, occupation or societal role can be regarded as requiring both theoretical underpinnings and practical application. The theoretical components consist of the relevant knowledge base and a deeper understanding of the principles on which that knowledge base is established. This may involve learning scientific or abstract disciplines that might seem quite removed from the practical application. Such learning usually resides formally within our educational institutions and is recognized through the granting of diplomas or degrees.”*¹¹⁸

Deniers of the subluxation seem to overlook the practical and clinical side of the lesion. A clinical finding is not necessarily a test tube-type existence – a phenomenon noted in medicine. Henry et al suggest ways to move beyond the theory of evidence based medicine towards a model which considers its methods, validity, and scope, and the distinction between justified belief and opinion – its epistemology. The vertebral subluxation would be more than just tacit knowledge and could be more a phenomenological model as well as a mechanistic model. McHugh and Walker note *the dichotomy between medical science and medical practice and that scientism “distorts clinical reality and impairs medical practice and medical ethics.* This would appear to apply to the subluxation debate.¹¹⁹⁻¹²¹

In further discussions as to the science of medicine, Sturmberg and Martin state firmly that medical knowledge is inherently uncertain’ although certain areas are both explicit and implicit. Malterud tends to confirm this when she *acknowledges the gap between ethical research and clinical practice.*¹¹⁶⁻¹²²

Superseded Terms

We must clarify that we do not refer to the subluxation as a bone out of place (BOOP)/ One of the earliest terms used to describe the entity that chiropractors were treating was often referred to as a Bone out of Place or BOOP. While this

descriptive term is seldom used today by practitioners, it does however remain a popular term with patients who sometimes express their condition as; “my neck’s out”, or” my back’s out”. These were also phrases used by patients following the Cyriax medical term of a “slipped disc” in relation to the protrusion, herniation or bulge of intervertebral discs, and this can also be somewhat misleading. However, the slipped disc term is still used in some medical papers today.¹²³⁻¹²⁶

In essence, the old ‘bone out of place’ idea regarding vertebrae is anachronistic unless it comprises a part of a definition in conjunction with an overall clinical finding. However, the degree of displacement is significant with minimal disturbance still having the potential to cause symptoms.

Apart from the more specific synonyms and euphemisms for the vertebral subluxation, a general word search reveals a variety of vague terms for the clinical findings which spinal manipulation seeks to address as elements associated with the subluxation. These include such terms as; *relieve pressure on joints, reduce inflammation, improve nerve function, pain, stiffness, muscle tension, mobilisation of affected parts, and soft tissue damage.* These terms indicate a broad range of signs and symptoms which suggest more than just a bone (slightly) *out of place* (BOOP) as the sole component. Such a situation invites an encompassing term with a descriptive definition. The WHO version suits this broader interpretation. Significantly, Sato, Haavik and others identify potential broader sequelae attributed to activated neural networks within the subluxation spectrum.^{93,127-130}

Local and more peripheral nociceptive sensations, increased sensitivity, paresthesias, muscle and neural tone, inflammatory and changes to structures due to pathophysiology changes to autonomic function are also common symptoms identified as being clinically associated with the subluxation.¹³¹

In quantifying a demonstrable medical subluxation, Ross and Moore identify it as an articular apposition of less than 50% displacement. This is compared to a diastatic vertebrae being displaced greater than 2mm. Apposition is defined as *the positioning of things side by side or close together.* That two millimetres (2mm) can be extreme and may incorporate other disturbances including pathoneurology and other connective tissue changes. It may also disrupt mechanical and neural function of the segment. These factors are not normally included in a plain definition of a subluxation. While this interpretation is a medical opinion, it tends to contradict the position taken by the subluxation deniers.¹³²⁻¹³³

Such a discussion leads to a further consideration of *when does a (medical) subluxation become a dislocation - and who and how does it become necessary to clinically address it. Associated signs and symptoms would be a reasonable start?* Finally, we are aware of no evidence that indicates that even slight disturbances of normal vertebral articular physiology are unable to cause or contribute to neurological symptoms or signs.

It would seem irrational to reject the subluxation premise when there is no original formal research which contradicts its existence. It is also irrational when the current understanding of the vertebral subluxation tends to explain the clinical

efficacy in so many cases. The rejection fails even further when the concept of spinal manipulation of subluxations or named equivalents, are being taken up by many within medicine and others in the manual sciences including *veterinary chiropractic*.¹³⁴⁻¹³⁵

For a vocal minority element on the fringe to question the existence of the subluxation and not offer a rationale for their stand is irrational and unscientific. It stifles the stimulation of reasonable and rational debate in trying to arrive at a consensus.

Relevance of Evidence

Unlike generalised manipulation, a specific adjustment must be focussed on an identified articular or segmental disturbance, either structurally, functionally, or both. Such abnormalities are noted by different professions under a range of identifying terms – synonyms and euphemisms, albeit with somewhat different interpretations.⁵⁹

The concepts are active in medicine and physiotherapy having previously been well evidenced in osteopathy and chiropractic. It seems particularly irrational when there is no dissent or controversy over these other terms such as somatic dysfunction.¹³⁶⁻¹³⁸

We are reminded of the axiom *the absence of evidence is not evidence of absence*. Indeed, it merely means that there is not the type or sufficient evidence to satisfy some approaches to clinical practice. Without evidence it is difficult to offer a blanket rejection of the subluxation premise - it can simply mean that more evidence is still emerging. We hold the view that further evidence is still emerging.

We felt this is particularly relevant when there is far more evidence in support of the subluxation and virtually none that substantiates an opinion against its existence. Nor is it likely that reservations exist in the minds of the very patients who have experienced the benefits of vertebral adjustments which are intended at correcting subluxations. So *something* must have been addressed to bring about a noticeable change in their symptoms. It would surely *feel like* structural change to the adjusted patient - and to the adjustor, suggesting value in experiential reports.

While high quality evidence at a unifying level supporting the subluxation concept is still evolving, much is already available. Practical clinical evidence would be recognised in patients in every hour of every chiropractor's working day. Palpatory studies and subjective patient indications of segmental pain or tenderness, muscle hypertonicity, lack of flexibility and associated signs and symptoms tend to identify and substantiate clinical findings inviting remediation. Hansen et al found an 85% success rate of identifying vertebral fixations with motion palpation by experienced practitioners. Subsequent positive efficacy of the adjustment as reported by the patient would confirm the site of etiological or contributory involvement by its amelioration.¹³⁹⁻¹⁴⁸

Identifying the Subluxation

Without the subluxation, an adjustment is merely a generic

manipulation of a spine without a diagnosed target. The evidence comparing the effectiveness of such with the evidence of a clinically identified subluxation eludes us.

There is evidence however of the importance of specificity of an adjustment.

The subluxation may often be more demonstrable on functional radiographs, although at times, they can be quite apparent on static films. On subsequent occasions they may not be demonstrable on plain film and the disruption may be clinically correlated with signs and symptoms, with further identification by integrating physical examination with sensitive palpation.⁶⁸

A number of orthopaedic tests, observations, and manual palpation also comprise part of the standard assessment procedures in identifying a segmental aberration. Haneline and Young reported in 2009 that '*A higher proportion of studies that assessed painful or tender points of the spine and sacroiliac joints reported acceptable levels of reliability.*'

Such palpatory findings may be traditionally considered indicative elements supplementary to a subluxation complex.¹⁴⁹

While Rey-Matias notes that this dysfunction can be *palpated including changes in tissue texture, increased sensitivity to touch (hyperalgesia), altered ease or range of movement, and anatomic asymmetry or positional change*. He also notes three factors of the dysfunction which involves position, direction of free motion, and direction of restriction.^{78, 150}

Regarding Evidence

Critics seem to consistently ignore citing the evidence in the Index to Chiropractic Literature, and in the PubMed medical index itself. Avoiding so much evidence must then result in inaccurate authoritative reports and superficially support a false claim of 'no evidence' to support their unique understanding of chiropractic concepts, despite manipulative medicine practitioners adopting the concepts, Appendices A-C.^{40,150}

An erroneous claim of no evidence is contradicted by recognition in the medical literature. (Appendix B) The fact that so many medical papers simply ignore this literature as well as the chiropractic research material and the many case reports, may well give the impression that there is a dearth of subluxation evidence.

Significantly, there is no requirement for all chiropractic evidence to be solely in the medical literature, particularly if barriers seem to hinder the listing of chiropractic journals in a medical index. Yet there appears to be a defining dictum to overlook this literature in many non-chiropractic papers, even when citing the material would be appropriate. Internet access to the Index to Chiropractic Literature is readily available.

Claims of a lack of evidence appear to be simply based on unsubstantiated opinion. Such a claim is ignoring existing refereed material, a closed-minded denial, or a deliberately

misleading denial for political expediency. A claimed shortage of evidence does not indicate that the subluxation does not exist.

The current understanding of the VS is the most appropriate premise so far in explaining the presence of a range of certain clinical symptoms and clinical signs relating to a subluxation phenomenon. This is further confirmed by the implementation of vertebral adjustments resulting in the reversal of those same clinical findings with positive outcomes. Amelioration of symptoms must mean that a positive response has occurred in executing a specific manipulation, particularly when the positive outcomes are so readily reproducible.⁷¹

Scientific Theory

Some may claim a lack of scientific reasoning over the subluxation, calling it a theoretical model of historical interest but have not supplanted it with a 'modern model'. However, that still would not necessarily mean that the subluxation lacks clinical, scientific, or biological significance. It is submitted that the subluxation premise meets the criteria of scientific method.

The formal scientific definition of theory appears to be quite different from the everyday meaning of the word. Theory refers to a comprehensive explanation of some aspect of nature that is supported by a significant body of evidence. Many scientific theories are so well established that no new evidence is likely to alter them substantially. For example, no new evidence will demonstrate that living things are not made of cells (cell theory), or that matter is not composed of atoms. One of the most useful properties of scientific theories is that they can be used to make predictions about natural events or phenomena that have been observed, and others that have yet to be observed. The presence of the vertebral subluxation could also be recognised in this light.^{3-12, 151}

In further substantiation of the principle of recognising evidence like that concerning the vertebral subluxation, Bogen states that "*scientists obtain a great deal of the evidence they use by observing natural and experimentally generated objects and effects. Much of the standard philosophical literature on this subject comes from 20th century logical positivists and empiricists, their followers, and critics who embraced their issues and accepted some of their assumptions even as they objected to specific views. Their discussions of observational evidence tend to focus on epistemological questions about its role in theory testing. This entry follows their lead even though observational evidence also plays important and philosophically interesting roles in other areas including scientific discovery and the application of scientific theories to practical problems.*"¹⁹

A scientific theory is a well-substantiated explanation of some aspect of the natural world. It is based on a body of facts that have been repeatedly confirmed through observation and experiment. Such fact-supported theories are not *guesses* but reliable accounts of the real world. The theory of biological evolution is more than "just a theory". It is as factual an explanation of the universe as the atomic *theory* of matter or even the germ theory of disease, Both are still regarded as *theories*. The theory of gravity is still a work in progress, but

the phenomenon of gravity, like evolution, is an accepted fact. Such theories are consistent with the construct of the vertebral subluxation which is supported by observation and clinical applications, as well as still being a work in progress.

[Adapted from The United States National Academy of Sciences]¹⁵²

Ignoring or rejecting the evidence on the vertebral subluxation should be a judgement choice based on evidence - not hearsay, not media hype, and not uninformed or biased opinion.

Unsubstantiated denial is merely unsubstantiated personal opinion that is not evidence-based. There appears to be no formal evidence supporting the denial case on the vertebral subluxation.

In essence, theories are shown here to be a part of the science spectrum without which there would be little development. There is suitable evidence in support of the subluxation theory.

Subluxation Dissent

Rather than just dismiss a subluxation concept, those questioning it are surely obliged to explain that which has been traditionally understood, and what chiropractors and osteopaths have been addressing for over 120 years. If it is said that there is no proof, then disclaimers must offer an alternative rationale for such a statement and offer detailed justification for their findings and therapy. If chiropractors, they must explain precisely what they are treating, and why – or alternatively deliver their research demonstrating a neutral finding. They must also name the target of their adjusting procedure and the rationale that supports it.

We were unable to locate any clinical conditions that do not have an identifying nomenclature. Our study found that there is not only far more evidence in support of a vertebral subluxation hypothesis, but an absence of contrary evidence. We dismissed unsubstantiated opinion as extraneous.

Those who reject the term *subluxation* do not appear to have offered reasons as to why they hold reservations in accepting the term. An explanation is awaited.

Practitioners may call this entity anything they like, but for scientific and clinical consistency it is not productive or constructive to seek to question a long-established convention or deny such a common clinical finding without evidential support to the contrary.

Some dissenters have questioned the existence of the vertebral subluxation due to a claim of a lack of evidence. A discussion is presented here which questions the veracity of such a stand based on the available evidence, logic, and precedence which would mitigate against such a position.^{3-12, 67, 73, 94, 153}

It seems rather myopic to mobilise a stiff, restricted spine through general manipulation based on unspecific or vague criteria. This assumes there is restriction somewhere in the spine. Such a process overlooks specific segments and resultant autonomic and physiologic concomitants at particular

The Essence of Biomechanical Diagnosis of the Spine

Matters that must be addressed by those manipulating the spine in the absence of a diagnosis of a vertebral subluxation include:

- If there is no such thing as a subluxation what exactly is being manipulated?
- If there is no such thing as a subluxation, why is manipulation recommended or contemplated to address a normally functioning spine?
- What justification is offered for legally accepting the patient for care?
- What explanation is recorded to explain vertebrogenic symptoms in the absence of subluxations?
- Indeed, what diagnosis is documented, remembering such diagnosis must be defensible in a legal setting, for insurance claims, and clinical protocol?
- In the absence of established framework what indicators are documented to justify therapeutic intervention as segmental adjustment or general manipulation?^{67, 73, 156-157}
- In a court of law, or to the patient, what justification could you offer for your chosen procedure?
- What are the aims of your chosen procedure, and why this particular procedure over another?
- What explanation is documented to explain the aetiology of the patient's symptoms, and your diagnosis, and your intervention?
- Should it be that the symptoms are determined to be vertebrogenic in nature, what documentation of the vertebrogenicity is cited in the absence of invasive pathology or severe tissue injury?
- How is the aetiology of a cervicogenic headache explained, when it responds to adjustments of the cervical spine?
- How would you explain vertebrogenic or subluxation aetiologies of conditions such as dermatomal paresthesias, sciatica, and intercostal neuralgia, and how would you differentiate other aetiologies?
- What explanation is offered for the biomechanical difference in objective terms (patient) and subjective terms (practitioner) between an asymptomatic spinal segment and a symptomatic segment?
- Is there a biologically plausible explanation for the dissipation of symptoms following an adjustment?
- What is the difference between a vertebral subluxation, somatic dysfunction, and a vertebral dysfunction – and define each?
- What is the rationale for a manipulation being associated with particular symptoms?
- What is the difference between a normal spine and one deemed in need of being manipulated?

- Would a normal spine produce similar symptoms?

An attitude of denial of the VS negatively perpetuates the myth that chiropractic is unscientific. If this was a fact, medical spinal manipulators and physiotherapists would not be adopting these aspects of the chiropractic and osteopathic models.

To claim one can't prove a negative is an invalid and fallacious argument. While there has been diverse opinion expressed over the subluxation, *there has yet to be formal evidence or even a serious investigation as to the fact that the subluxation is not an entity. And to preempt a debate with the idea that one cannot prove a negative has been dismissed as an avenue of argument.* (Law) In effect, the proof of rejection must come from those who make the denial. That proof is awaited, as is a proposed alternative hypothesis.¹⁵⁸⁻¹⁶⁰

Perhaps, the most the deniers could say is that the subluxation is a yet-to-be conclusively proven hypothesis, but that hardly stands-up against the demonstrable clinical findings and positive outcomes. It is the most appropriate hypothesis that explains and justifies the growing demand for its utilisation, particularly when hypotheses constitute parts of all health professions' models.

It is noted that the vast majority of chiropractic associations, colleges and practitioners support retention of the use of the subluxation term. Walker and Buchbinder noted in their 1997 study that "*Subluxation was included as the preferred term of 294 respondents (67%)*". A decade later, a further study by Smith and Carber supported Walker et al in their finding. They averred that "*Based upon those surveyed, chiropractors seem to embrace subluxationbased terms in describing their care for chiropractic patients.*" A majority 75% (34 of 46) of chiropractic institutions utilise the term subluxation in preference to any other. In addition, a recent 2019 study by Mior and colleagues noted that *chiropractic subluxation* was inclusive as a common diagnostic term.¹⁶¹⁻¹⁶³

In further confirmation, a survey by McDonald and colleagues in 2004 found that 88.1% of chiropractors preferred to retain the term subluxation. We are not aware of any survey that found against retention of the term subluxation.¹⁶⁴

To deny the subluxation and the physiological effects of its correction inherently demands an explanation regarding the apparent positive outcomes in the many case reports, randomised controlled studies, literature reviews, and meta-analyses published in refereed journals. It is unscientific to ignore these positive outcomes because they may not meet self-imposed, unsubstantiated opinion under laboratory-type criteria. If subluxated vertebrae were not involved, what alternative researched phenomenon would explain positive clinical outcomes?

If there is such a move to delete this basic principle that identifies the chiropractic profession, then followers should form their own profession under a different name or join another generic profession. In denying one of a profession's pillars decries the established fundamentals of that profession. To do so, essentially creates a different profession under a

different name. That option should be taken up by deniers if that is the direction they seek to go.

Clinical Considerations

Multiple clinical observations supporting findings of positive outcomes resulting from correcting functional spinal lesions underpin the manipulative sciences. The vertebral subluxation is a recognised altered state, and cervicogenic headaches can be recognised as an example of the effect of such a deviation from normal. Once identified, these headaches may be resolved with correction of the subluxation. This would essentially represent a cause and effect characteristic of manipulative care.¹⁶⁶⁻¹⁶⁹

A recent study indicated that chiropractors and massage therapists are the most commonly consulted optional health disciplines. Chiropractic services were adopted by up to 55.3%, of the male population in some areas. If the profession is noted for correcting subluxations with positive efficacy, then as a demonstrably safe profession, that should represent a fair endorsement and acceptance of the model of care – one with which health authorities and governments seem loathe to take advantage of.¹⁷⁰

Anecdotal and narrative evidence can be positive clinical observations and an acceptable basis from which to evolve and develop beneficial models of health care for patients. They are recognised as parts of the evidence tree. Conversely, *ignoring* the positive outcomes – and any ineffective or adverse outcomes associated with such observations could be regarded as a disservice – or may even be considered as negligent. It could certainly constitute poor clinical practice and a profession that adopts such a stand would not continue to thrive.¹⁷¹

When a clinician observes a positive patient response to a particular procedure, they are duty bound to record it. If there are repeatable positive outcomes it is in the interest of patients generally for the practitioner to assess, research, and report such findings – which in turn, may lead to possible further development of the findings. The findings should also be recorded if the outcomes are ineffective or adverse.

Specificity and the Vertebral Adjustment

This chiropractic adjustment is based on a pre-determined analysis which is focused on an identified spinal mechanical lesion. The adjustment is implemented as a refined form of the more generalised and non-specific manipulation. It may be considered at the highest order of psychomotor skills on the manipulation spectrum.^{54,67,73,94,129}

Due to the possible wider neurological ramifications of the vertebral subluxation, the need for specificity has been the distinct purview of chiropractic. This necessitates the implementation of segmental adjustments as opposed to the more general manipulation or mobilisation.

It is difficult to comprehend the opinion of subluxation deniers. Other manual manipulative professions do not appear bothered in disputing the evidence identifying this biomechanical lesion which they address. Still others seem

happy with the concept as long as it is not referred to as a subluxation. In any case, whatever term is used it must be clarified by definition.^{59,87,128}

In the ICD, there are however, a number of conditions that are recognised but not necessarily readily demonstrated physically. In everyday general practice, there can be no independent confirmation that a patient may be suffering headaches, sciatica, a visual defect, or certain other pains. Nor can these conditions be necessarily visualised and confirmed by observation on radiographs. This is similar in principle to subluxation radiology. In a further comparative example, attempting to demonstrate all vertebral subluxations on MRI could at times be akin to trying to demonstrate trigeminal neuralgia on plain film or indeed an MRI. Because trigeminal neuralgia cannot be demonstrated on MRI, does not mean it does not exist. Again, the efficacy of a management approach is justified by safe care and positive outcomes – without necessarily being demonstrable on plain film radiographs.¹⁷²

Health practitioners will note that patients are usually aware of localised symptoms as in localised vertebral pain or discomfort. It is these symptoms that may initiate a patient's presentation. They are aware when these sensations are alleviated by an articular release by a segmental adjustment. In such cases, the symptoms may therefore constitute an association with the dysfunctional component of the vertebral subluxation – designated vertebrogenic. A positive outcome would not necessarily be expected if a non-involved segment was to be adjusted - nor would one expect signs or symptoms to be present in the first place if segments were functioning normally as in joint physiology.

The Pathophysiology and Pathneurophysiology – Scientific Indications

Arguably, among the most convincing texts written in support of vertebral influence is the independent research conducted by neurophysiologists Sato and others in Japan, with additional major contributions in elucidating this model including those by Henderson, Cramer, Darby, Bolton, Budgell, Jänig, Patterson and Pickar.^{129,130,173-178} Overlooked historical pioneering research includes that by Burns and Cleveland.¹⁷⁹⁻¹⁸⁰

Indications as to the integration of neural ramifications associated with a VS cannot be overlooked in a discussion on this topic. The example of cervicogenic headaches cannot mean that the cervical spine is the only region with etiological properties of vertebrogenic conditions. While the term vertebrogenic may be somewhat presumptuous, it may well be that if not an aetiology in itself, it may be one of the influential factors in the aetiological process through somatosensory or somato-autonomic reflexes as suggested by Sato et al.¹⁸¹

Medical Recognition of the Subluxation & The W.H.O.

(See also Appendices A and B)

Medical recognition of the vertebral subluxation has been provided by Schmorl & Junghanns, Hadley, Keats, Sato, Epstein, and in Gray's Anatomy. Authoritative evidence contradicting these references does not seem to exist.¹⁰¹⁻¹⁰³

Of particular note also, is that afforded by The World Health Organisation's International Classification of Disease (ICD 10) which classifies the "Subluxation complex (vertebral)" as Item M 99.1.¹⁸⁷

M99.0 is listed as "Segmental and somatic dysfunction"
M99.1 is listed as "Subluxation complex (vertebral)"
M99.11 Subluxation complex (vertebral) of cervical region

Subluxation I

A lesion or dysfunction in a joint or motion segment in which alignment, movement integrity and/or physiological function are altered, although contact between joint surfaces remains intact. It is essentially a functional entity, which may influence biomechanical and neural integrity.

Subluxation complex (vertebral)

A theoretical model and description of the motion segment dysfunction, which incorporates the interaction of pathological changes in nerve, muscle, ligamentous, vascular and connective tissue.¹⁰⁷

The WHO also recognises a "Segmental and somatic dysfunction: - (M9900). Although it does not define these terms in the booklet on osteopathic training, the literature evidence appears to support the chiropractic definition of a vertebral subluxation. Science Direct defines somatic dysfunction as:

*"Somatic dysfunction is defined as impaired or altered function of related components of the somatic (body framework) system: skeletal, arthrodiagonal, and myofascial structures and related vascular, lymphatic, and neural elements."*¹⁸²⁻¹⁸⁶

Despite the similarities, osteopaths do not seem to be questioning the evidence regarding somatic dysfunction. One is hard-pressed to differentiate the interpretation of a somatic dysfunction from a subluxation as understood by chiropractors and offered by the WHO as follows.

As a subluxation is recognised by such an august body as the World Health Organisation and coded in its International Classification of Diseases (ICD 10) it constitutes an endorsement in itself. It seems pointless and counterproductive to deny its existence particularly when it is allotted a specific item number.¹⁸⁸

The World Health Organisation has to be the ultimate authority on health matters. It has defined and categorised the subluxation and subluxation complex. Its definition of a subluxation is a more comprehensive one compared to the limited traditional displacement model. Being more descriptive, the intent and meaning of the recognised WHO term is considered more accurate and appropriate by taking into account other ramifications of the disturbed segment than the equivocal traditional definition which states that a subluxation is: *"An incomplete or partial dislocation."*¹⁸⁹

Further, arguably the ultimate medical anatomy textbook *Gray's Anatomy* recognises that a subluxation may occur as a

biomechanical aberration of the sacroiliac joint.¹⁹⁰ (See also Appendix A)

As long as the clinical findings meet the WHO definition they must carry more authority than mere unsubstantiated opinion. It is submitted that an unreferenced claim denying the subluxation in an absence of supporting evidence is not science nor is it rational when measured against such authorities.

Chinese literature has also recognised the principle of this segmental dysfunction.¹⁹¹

The Chiropractic Recognition of the Subluxation

(See also Appendix C)

Emerging research is leading to a greater understanding of the neural ramifications involving vertebral subluxations. Research by Sato, Haavik, their colleagues, and others exploring the neurophysiological basis of somatosensory elements of the autonomic-visceral reflex phenomenon, are extensive. They describe somato-sensory-visceral reflex pathways associated with a vertebro-visceral association. The concepts are summarised in various sources.^{3-12,67,73,94,129,192-210}

In view of the volume of this research, there is an intellectual honesty in accepting and incorporating the term subluxation. It has assumed a useful purpose for a clinical term readily understood under biological and physiological scientific principles. It is then up to others to come to understand it, just as other professions such as dentistry and veterinary science have their own identifying terminology which is accepted by those who are not members of those professions.

The currently understood principles of subluxation hypotheses would appear to be more widely adopted and appropriate in explaining a number of clinical presentations. A case for not using the term has not been established.

To reject the term subluxation but to acknowledge its principle is to effectively reject a scientific premise, method, with clinical findings by removing a testable entity. In turn, this renders attempts towards scientific contributions somewhat void. It also diminishes the opportunity in the stimulation of intellectual enigmas and challenges. In essence, subluxation detractors and misanthropists:

- Fail to name the biomechanical aberration that they specifically identify to justify manual intervention. In addition, this lesion is identified as being *different* to other vertebrae in the same spine, particularly adjacent segments. [If it is not *'different'*, why is it being addressed at all?]
- Fail to accept that if it is *different*, it is worthy of an identifying noun. (To call it a stiff or locked joint is to ignore the significance of its neural ramifications.)
- Fail to demonstrate the biomechanical difference between the identified lesioned segment and one that is 'normal',

- Fail to append an identifying term to the target being regularly addressed by chiropractors and osteopaths.
- Overlook the contradiction of the possible existence of conditions associated with the subluxation that may only be clinically acknowledged and objectively demonstrated with subjective input (e.g pain, aches, sciatica, diplopia.)
- Overlook the facet syndrome in neurological or functional terms.
- Overlook the fact that osteopaths and physiotherapists have also identified a mechanical lesion but name it differently. [These professions do not seem to have the 'doubters' who question the target in administering their treatment.]
- Seem stuck on the medical definition that a subluxation is a 'displacement' and conveniently overlook the *dysfunction and neurological elements of the complex*.
- Seem to assume that the only acceptable evidence should be that found in medical journals.
- Overlook the fact that the World Health Organisation lists the subluxation in its ICD.
- Overlook the clinically accepted term 'cervicogenic' which is also in the ICD, and that cervicogenic headaches may be acknowledged as being mechanical in origin with apparent neurological connotations.
- Seem to be selective in ignoring the evidence that does exist.
- An admission that the traditional definition of a subluxation ignores the associated neural, structural and functional sequelae of the disturbances associated with such a disruption. Except in a dry skeleton, it is simply not physiologically possible for a traditional osseous subluxation to exist while ignoring the intimate association of other tissues, structures and functions. It is far more complex than just a minor osseous displacement. Hence the limited traditional definition is deficient by not taking into account this range of the concomitant elements of disturbed structures and functions. Importantly, some of these other disturbances include the effect on mechanoreceptors and somatosensory, somato-autonomic, and somatovisceral neural reflexes.
- An outright rejection of the credibility explaining the success of the concept over such a lengthy period of time.
- An acknowledgement that the criticism and cynicism, even contempt over so many years was not justified. This would then lead to questions of why – and is it an attempt to preserve one's own self interests?
- Recognition that the traditional definition is limited and overlooks the importance of the potential effects of such a lesion, especially the neurological associations - again recognised by Sato and others.
- A tacit admission of a lack of appreciation of basic neurophysiology and functional anatomy.
- Acknowledging a rejection would be too humiliating to retract after such strident opposition over many decades.²¹⁵⁻²¹⁷
- Contradictory when a chemical (pharmaceutical) model is applied to address a physical-mechanical condition.
- Ignores the demand for chiropractic care by a large percentage of the public. That care consists largely of addressing the vertebral subluxation.
- An embarrassing admission for critics to confess past erroneous opinion – we were wrong and misleading over all these years. There is already tacit recognition of the VS by the number of medical practitioners now adopting manual manipulative spinal procedures, and the number of medical textbooks on SMT now appearing on the market.^{150,219-225}

Politics in Healthcare – Is a limited model of health care healthy?

The very existence and the popularity of alternate professions in health care essentially questions aspects of the incumbent medical monopoly at the political level. It seems other fields benefit from the stimulation of competition except for that in the provision of health services. This gate-keeper dominance essentially overrides questions of its authority on matters involving other professions. It would seem inappropriate for medical doctors to be cast as expert authorities in the absence of the subluxation model being studied in medical training. In addition, the suspicion and obstructionist resistance over many decades must prejudice opinion, despite individual medical doctors adopting the chiropractic model.²¹⁰⁻²¹⁸

There is an established history of political medicine having fought to oppose other health care models only to see them later absorbed into medicine. It is suggested that it is the subluxation model that has kept chiropractic in demand and at the forefront in providing that distinct health service, with growing adoption by many in medicine.

Some original critics of the subluxation could be disadvantaged by acceptance of the subluxation concept. It may be claimed that denying the subluxation complex is effectively:

Summary

It is logical, reasonable, practical, fundamental, precedential and at times even critical, that a clinical observation constitutes an element of evidence. It could be seen as negligence not to recognise it.

There appears to be a double standard whereby medical care continues with theories, anecdotal and narrative evidence, but suggests that other health professions may not – or that it is unscientific if others incorporate that form of evidence as a part of the overall evidence base.

Not only is there interprofessional support for the vertebral subluxation *PREMISE*, but there is a sound, legitimate theory behind that premise, with a long history of use and acceptance.

Recognition of the subluxation model (or vertebral subluxation complex) is now becoming widely accepted with greater understanding - albeit an evolving model. It is possible however, that current understanding may eventually be superseded by a more appropriate and comprehensive rationale.

No substitute rational clinical explanation for the subluxation is evident at the moment. As currently understood, the premise of the vertebral subluxation would seem to be the most appropriate explanation in describing the positive patient responses in documented clinical outcomes following segmental adjustment of the subluxation – its modification and amelioration.

To support their case, deniers of the subluxation hypothesis are called on to state the difference between a subluxation and some of its other openly accepted terms such as somatic dysfunction, musculoskeletal dysfunction, and vertebral dysfunction.

Deniers must also state their rationale for the acknowledged clinical presentation of conditions under such basic clinical examples as cervicogenic headache, intercostal neuralgia, and even lower back pain of mechanical origin. Segmental radicular pain and sensory aberrations may be acknowledged as a vertebrogenic phenomenon. These symptoms may be interpreted as basic neural elements of subluxation involvement.

Without the recognition of the vertebral subluxation and the adjustment, chiropractic is no longer chiropractic and the features that so successfully brought the profession to its current high level of demand would arguably be lost as a public health service.

Further, without the full subluxation premise and the adjustment rationale, chiropractic is just one of the manipulating professions and the specialty is essentially lost. Perhaps this is the fog into which self-interest professions wish to embed chiropractic to ensure its demise.

There are far too many physiological, anatomical, and clinical indications, and documented findings to dismiss the sound premise of a vertebral subluxation.

It is clinically, scientifically, physiologically, and ethically unscientific to ignore joint pathophysiology, associated neural pathophysiology, and basic biomechanics involved with the subluxation complex. To claim that the subluxation premise is not evidence-based would appear to be either uninformed opinion or considered avoidance of the literature.

The Palmers established chiropractic and their named profession has stood on that basis for 120 years. To try and alter the fundamentals is an attempt to create a new and different profession - one example among a plethora of other attempts to adopt versions of the success of chiropractic, but without acknowledging the deeper concepts. By all means

create a new profession with different notions, but do not claim it is chiropractic.⁵⁴

Adoption of an understood term such as a vertebral subluxation is essential in order to nominate the target of the contemplated adjustment. To cease use of the term subluxation would only necessitate the adoption of another simile that would then demand yet another definition and the circus would start all over again.

"The subluxation concept has also been adopted in medicine (Appendix A). If such medical authorities as well as the WHO can recognise and accept the subluxation, there is no reason why the chiropractic profession cannot continue to also embrace it. It is noted that the weight of literature strongly supports the subluxation as a clinical finding."

A claim of no evidence supporting a subluxation premise if not supported by the facts. The term subluxation of a vertebra is relevant and appropriate based on contemporary understanding and evidence.

Critics of the subluxation premise must explain that if a subluxation has no proof of existence, what is a *spinal dysfunction*, how is it different to a subluxation, and why is spinal dysfunction not only accepted but remains unchallenged?

"Scientific knowledge is based on observations of nature. From observations of many different events and situations, scientists try to find patterns and create generalizations as to the underlying fundamental processes involved." Strobel N, 2000.²²⁵

Conclusion

In essence, we find that no case has been established which seeks to substantiate a rationale to drop, alter or otherwise change the clinically recognised term vertebral *subluxation*.

Independent recognition of the potential neurological ramifications of vertebral subluxations has been offered by Gyer et al. They state that spinal manipulation has "...*both biomechanical and neurophysiological phenomena (which) have been thought to play a role in the observed clinical effects of spinal manipulation, a growing number of recent studies have indicated peripheral, spinal and supraspinal mechanisms of manipulation and suggested that the improved clinical outcomes are largely of neurophysiological origin, "* and further that *"The body of literature reviewed herein suggested some clear neurophysiological changes following spinal manipulation, which include neural plastic changes, alteration in motor neuron excitability, increase in cortical drive and many more."* Such reasoning tends to support the long-held chiropractic premise.²²⁷

It would be grossly inconsistent to provide manipulation on a spine without identifying the site and reason for that procedure, or if identified, use another term with a similar meaning and intent. Such a move would confuse patients. It is the responsibility of health professions to accept and understand the definition and intent of this century-old terminology – vertebral subluxation.

We submit that it would be unscientific, illogical, impractical and clinically irresponsible to deny or ignore the evidence in support of the vertebral subluxation premise.

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Appendix A: MEDICAL TEXTBOOKS AND PUBLISHED PAPERS WHICH RECOGNISE THE VERTEBRAL SUBLUXATION

[Some may use terms such as biomechanical spinal lesions or vertebral dysfunction as euphemisms.]

The World Health Organisations, International Classification of Disease (ICD 10), classifies Item M 99.1 as a "Subluxation complex (vertebral)".

‘Spinal manipulation’ - Bourdillon JF, Day EA. 1988

‘Manual of medical manipulation’ – Burn L. 1994

‘Textbook of orthopaedic medicine; Vol II: Treatment by manipulation and massage. - Cyriax. J. 1965

‘Musculoskeletal Manual Medicine’ - Dvořák J. 2008

‘Atlas of normal roentgen variants that may simulate disease. Keats TE, Anderson MW. 7th. edn. St Louis: Mosby Inc;2001.

‘Managing Low Back Pain.’ – Kirkaldy-Willis WH, Bernard TN. 1999.

Other causes of dyspepsia - especially abdominal pain of spinal origin. Krag E. Scand J Gastroenterol Suppl 1982;79:32-37.

‘Manipulative therapy in rehabilitation of the locomotor system.’ – Lewit K. 1999

‘Manipulative therapy: Musculoskeletal medicine.’ - Lewit K. 2009

‘Manual Therapy in Children’ Biedermann H. 2004

‘Orthopaedic medicine: A new approach to vertebral manipulations. - Maigne R. 1972

‘The science and art of joint manipulation. v 2. The spinal column. - Mennell JM. 1952

‘Clinical biomechanics of the spine.’ – White AA, Panjabi MM. 1978

‘Cervicogenic” headache. An hypothesis.’ Sjaastad O, Saunte C, Hovdahl H, Breivik H, Grønback E. Cephalalgia. 1983 Dec;3(4):249-56.

‘Spinal manipulative therapy: Russian approach.’ - Pikalov A. 1995

It is significant when so many medical authorities recognise the vertebral subluxation in their textbooks, and deniers still reject the concept without supporting evidence.

Hadley’s chapter on The Cervical Spine (p.114) discusses the radiological findings and specifically notes vertebral fixations and “subluxations (partial displacement) (p. 128), and “fixation of movement” (pps. 125, 127). He recommends functional views to accentuate these aberrant movements. He also notes that “passive manipulation...is normally possible...” p. (130) Hadley LA. Anatomico-roentgenographic studies of the spine. Springfield. Charles C Thomas.1976.

Appendix B: MEDICAL TEXTBOOK EXTRACTS

Maigne also recognised sacroiliac subluxations(pp390) and also refers to subluxations as “minor intervertebral derangements’. (pp 27) Further, he associates manipulation of this “anatomopathology” with various “functional disturbances manifesting as organic conditions.” (pp 164)

In his text on spinal manipulative management under the heading of functional disturbances, the once head of the physical medicine department of a Paris hospital lists such conditions as constipation, certain digestive pains, asthma, facial pain, Basedow's disease, mastodynia, palpitations and pseudo-ulcers, as conditions that have responded to spinal manipulation(pp 164) and Barrés Syndrome (pp192-209)

Maigne states quite clearly that “It is impossible to speak of manipulations without saying a word about ‘sacro-iliac subluxations’. These subluxations are one of the frequent conditions attended by chiropractors”. He notes further that these subluxations can be responsible for low-back pain, acute lumbagos, and sciaticas. Maigne also discusses a vertebrogenic association with a range of functional visceral disorders.(164,192-209)

Maigne R. Orthopaedic Medicine: A new approach to vertebral Manipulation. Thomas, Illinois. 1972:

White and Panjabi recognise the hypothesis of the chiropractic subluxation and note that “In order for manipulation to be successful, (manipulators) must somehow produce improvement using mechanical alteration...”

White AA, Panjabi MM. Clinical biomechanics of the spine. Philadelphia. JB Lippincott Co. 1978;313-314.

The 1980 edition of Gray’s Anatomy stated in reference to the sacroiliac joint that “locking may occur...” and that “This so-called subluxation of the sacro-iliac joint causes pain” and that “reduction by forcible manipulation may be attempted.”

Williams PL, Warwick R. Gray’s Anatomy 36th Edn. New York: Churchill Livingstone; 1980;477.

Biedermann's medical text devotes a whole chapter by Theiler on the manipulative management of Attention Deficit Disorder (ADD).(pp133-144) There is also a specific section in that book on colic,(pp 295-297) as well as discussions on mechanical dyspnoea syndrome and asthma. (pp 195)

In recognising the functional subluxation Biedermann advocates:

- Optimise the fixation prior to manipulation,)
- Manipulate as fast as possible, i.e. with an impulse of minimal duration. P 206

Biedermann H. Manual Therapy in Children Edinburgh: Churchill Livingstone. –2004.

In a similar vein on medical spinal manipulation, Lewit has a section on vertebrovisceral correlations, where he discusses various published medical papers on numerous 'visceral' conditions. His dissertation covers conditions involving the tonsils, heart, lungs and pleura, stomach and duodenum, liver and gall bladder, kidneys, as well as gynaecological disorders.

Lewit K. Manipulative therapy: Musculoskeletal medicine. 2009:281-287.

NB Physiological subluxations can occur on children's X-rays, simulating dislocations, particularly of C2 on C3 and C3 on C4 on forward flexion. In such circumstances there may be steps in lines 1 and 2 but line 3 will remain intact. All three lines are out of alignment with a real subluxation. Keats and Anderson also coined the term ("Physiological subluxations")

Keats TE, Anderson MW. The neck. Chapter 3. In: Atlas of normal roentgen variants that may simulate disease. 7th. edn. St Louis: Mosby Inc.2001:66, 222-223.

"Subluxations of vertebrae occur in all parts of the spine and in all degrees... When the dislocation is so slight as not to affect the spinal cord, it will still produce disturbances in the spinal nerves...." -Warbasse

Warbasse JP. Subluxation of vertebrae. In:Surgical treatment. a practical treatise on the therapy of surgical diseases for the use of practitioners and students of surgery. Vol 1. WB Saunders Co, Phil. 1918:623.

Extracts from Schmorl G, Junghans H - one of the ultimate authoritative texts on the spine.

"Like any other joint, the motor segment may become locked.....As a result of recent experience, there is no doubt that the causes for such disturbances are located in the motor segment." p 221-222.

"The motor segment can suffer in its entirety substantial injury without bone involvement.

These are primarily subluxations..." p 250

"Slight traumatic functional disturbances...are almost always reversible." p 251

"Painful limitation of motion" p 251

"Stiffening of the involved segment." p 251

"Articular locking is also possible in the spinal articulations" p 376

Schmorl G, Junghans H. The human spine in health and disease. New York. Grune & Stratton. 1971.

Another authoritative medical text is by White and Panjabi who note that spinal manipulations for chiropractic subluxations must "produce improvement using mechanical alteration..." on spinal structures "...that may be moved, stretched, stimulated, or relaxed"

White AA, Panjabi MM. Clinical biomechanics of the spine. Philadelphia: JB Lippincott Co. 1978

A further medical doyen on the spine is Hadley. He describes "Subluxation (partial displacement) of the vertebral bodies..."(pps 128-129), and a "spontaneous subluxation" in recognition of the term.(pps 132,127-149)

Hadley LA. Anatomico-roentgenographic studies of the spine. Springfield. Charles C Thomas.1976;127-149,430-438

Epstein notes that subluxations need to be evaluated clinically for restrictions of spinal movements, to confirm radiological findings. Alignment of spinous processes can be pathognomonic for subluxations.

Epstein BS. The spine – a radiological text and atlas. 3rd ed Philadelphia: Lea & Feibiger. 1976:30,557-559

In his textbook Murtagh identifies the vertebral subluxation as vertebral dysfunction, a term used regularly in his text. He also defines a subluxation as a partial displacement such that the joint surfaces are still in partial contact.

Murtagh J. Spinal dysfunction. Murtagh's General practice, 5th Edn. North Ryde, Australia, 2013:222. https://www.academia.edu/21876092/John_Murtagh_s_General_Practice?auto=download. (Extracted 19 Sept 2019)

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