



It is noted however, that mounting manual therapy research in recent years is recognising the neurological element of spinal aetiologies, particularly in relation to the central sensitisation of pain, cervicogenic headaches, and lower back pain. (4, 5, 6, 7, 8, 9, 10)

Not only is a chiropractic version of a subluxation acknowledged in medical literature, it is based on neurophysiological principles as noted by Sato, Sato, and Schmidt in their text '*The impact of somatosensory input on autonomic functions*'. (11) Their detailed studies confirm that spinal influence is particularly strong on the somatic element of somatosensory, somato-autonomic and somatovisceral reflexes. The significance of the role played by the spine lies with its integration with, and influence upon the autonomic nervous system. Sato et al recognise this by stating:

'In contrast to the impressive body of knowledge concerning the effects of visceral afferent activity on autonomic functions, there is, generally speaking, much less information available on the reflex regulation of visceral organs by somatic afferent activity from skin, the skeletal muscle and their tendons, and from joints and other deep tissues. The elucidation of the neural mechanisms of somatically induced autonomic reflex responses, usually called somato-autonomic reflexes, is, however, essential to developing a truly scientific understanding of the mechanisms underlying most forms of physical therapy, including spinal manipulation and traditional as well as modern forms of acupuncture and moxibustion.' (Emphasis added)

It should be noted that the spinal manipulation used by chiropractors is primarily directed at what they identify as vertebral subluxations, although these biomechanical disorders can affect various articulations throughout the body. The term is widely used by the profession. (16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33)

A search of the reveals 355 papers listed with the term 'subluxation' in their 'title', 549 under 'Subject/Keyword', and 917 in 'All Field's' (34)

## Review

We submit that as the ultimate authorities of *Gray's Anatomy* and the *World Health Organisation* recognise the term 'subluxation' and 'subluxation complex', substantial researched evidence would need to be produced to oppose the concepts. However, there is additional evidence produced here which depicts medical recognition of the subluxation term and its ramifications. This is represented by citing use of the term subluxation in a broader context in a range of medical textbooks on the spine, as well as a number of medical journal papers.

*Gray's Anatomy*: Noted significance has to be attributed where it is 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*'. (35)

*World Health Organisation*: While it seems somewhat imprecise to call it a disease, the vertebral subluxation has already been recognised by the *World Health Organisation* (WHO) in its publication, the *World Classification of Diseases* (ICD-10), which classifies '*Biomechanical lesions, not elsewhere classified*' as item M99. It sub-classifies the VSC as item M99.1: '*Subluxation complex (vertebral)*'. Item M99.0 is designated '*Segmental and somatic dysfunction*'. These conditions come under the broader heading of '*Diseases of the musculoskeletal system and connective tissue*' (M00-M99), and '*Other disorders of the musculoskeletal system and connective tissue*' (M95-M99). In placing M99.1 Subluxation Complex (Vertebral) under the classification of (M99.0 Segmental and somatic dysfunction) it recognises it as a distinctly separate entity. (36)

The vertebral subluxation has long been recognised by manual therapists and also by those involved in manual medicine, also known as manipulative medicine. It is recognised in the medical literature. Further recognition of the acceptance of the subluxation concept can be found by noting that there would be few if any, clinical findings in any health profession that have attracted some 500 synonyms, euphemisms, or other terms intimately related to the chiropractic subluxation. While not necessarily definitive proof in itself, this enigma of so many interpretations in the terminology may

be seen as tacit recognition of an aberrant biological state, one that is different to normally functioning articular spinal segments, both anatomically and physiologically. (37, 38, 39, 40, 41)

Some critics question the subluxation because it is not clinically demonstrable, whereas it has been shown that inter-examiner agreement is particularly high. It has been suggested that to demonstrate or prove objectively that a patient has a headache would in fact be more difficult than proving that they have a subluxation. Similarly, anaesthesia has long been used in medicine but it is primarily based on empirical evidence. There is still much unknown about how it produces its necessary benefits, especially at the molecular level. This void has not raised questions as to whether or not it should be used, unlike those that query the subluxation. (42, 43, 44, 45, 46, 47, 48)

Some critics may suggest that the lack of a consistent definition is sufficient grounds for denying the existence of a subluxation. (1, 49) A similar claim could be made against the subluxation synonyms adopted by others. This would include terms such as manipulable lesion, facet joint lock, vertebral locking, end-play dysfunction, and cervical dysfunction, as well as others from a list.

Use of the term subluxation may be somewhat ambiguous in that it traditionally has had a different interpretation in the medical lexicon. While even that definition may be ill-defined, the case for the term of chiropractic subluxation or vertebral subluxation complex would clarify any ambiguity. The concept of a subluxation complex is subject to continuing interpretation as evidence emerges as well as other professions recognising it as a clinical entity. That evidence appears to be most supportive as no contradictory evidence or original research was identified.

There is noted evidence of medical use of chiropractic concepts particularly in European medicine, with many medical journals incorporating papers on these concepts, far more than in English language medical journals. Examples appear to be a distinct contradiction in attitude within medical circles. (50, 51, 52, 53, 54, 55, 56, 57, 58) In 1987, the medical doctor Gutmann stated in relation to birth trauma of infants that *'The paediatrician's diagnosis as well as the chiropractic and radiological examinations are of decisive importance...If the indications are correctly observed, chiropractic can often bring about remarkably successful results, because the therapy is a causal (i.e. pivotal) one.'* (59)

Logic alone would dictate that manipulation addresses a particular dysfunction, or a biomechanical spinal physiological abnormality. A manipulation would not be necessarily directed at a symptomless, normally functioning biomechanical spinal segment. Such a biological disturbance as the subluxation needs to be identified by nomenclature, to differentiate it from unaffected articulations. Chiropractic has survived and thrived today because it has recognised and addressed such lesions, and responded to patient demand - based on its understanding in managing subluxation-related disorders.

### Medical Textbooks on Subluxations (Extracts)

The medical doctor Warbasse described the chiropractic model of a *'subluxation'* in his text as early as 1918. He used that term to describe the vertebrogenic neurological implications of these clinical findings. He stated that *'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'*. .... He later refers to these as *'common subluxations'* and *'finer displacements'*. (60)

Finnesson discusses a *'Manipulable Spinal Lesion'* but recognises that it is euphemistically called a subluxation, osteopathic lesion, vertebral fixation, blockage and somatic dysfunction. Further, he does acknowledge vertebral malposition and abnormal vertebral motion, amongst other characteristics of the clinical finding. (61)

Schmorl and Junghanns would be two of the most noted medical spinal authorities who recognise segmental spinal disturbances. In discussing vertebral locking Schmorl and Junghanns nominate the spinal origin of autonomic influence when they refer to terms such as spondylogenic-neuro-autonomic, spondylogenic-vascular and spondylogenic pelvicopathy in relation to intervertebral insufficiency. (p. 219) They note that slight subluxation of vertebrae may occur. (p. 251) (62)

However, it is the noxious input from acute and chronic, sudden, and subliminal afferents that may constitute the key element in the vertebral subluxation complex. This would constitute a model of a somato-autonomic subluxation complex, the SASC. Schmorl and Junghanns also refer to *'intervertebral instability and spondylogenic disturbances in relation to 'interplay between sub-threshold autonomic nerve irritation and symptoms which appear a considerable distance from the nerve.'* (p. 227)

These authors recognise the dysfunction in a chiropractic subluxation and differentiate it from a medical subluxation, which they call articular locking and inefficient motor segment. They also note that *'many physicians employ manipulations'* similar to those used by chiropractors and osteopaths. (p. 376) They discuss conservative treatment of intervertebral insufficiency and its spondylogenic sequelae and note the body's own healing tendency and manual spinal treatment in relation to chiropractic and other manipulation professions. (p. 224)

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'*. (63)

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) (64)

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. (65)

Keats notes that *'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.'* (66)

In the textbook *General Practice* by the medical lecturer Dr John Murtagh from Monash University in Melbourne, Murtagh identifies the vertebral subluxation as vertebral dysfunction (and spinal dysfunction) as one of the possible etiological factors in a range of possible conditions. He also places emphasis on biomechanical lesion, as he regards vertebral dysfunction as one of only seven specified conditions that may simulate or masquerade as other conditions. Murtagh notes that a range of spondylogenic autonomic-related symptoms apart from pain syndromes may be associated with this dysfunction. In the cervical spine these may include:

- Headache
- 'Migraine'-like headache
- Myelopathy (sensory and motor changes in arms and legs)
- Ipsilateral sensory changes of scalp
- Dizziness/vertigo
- Visual dysfunction.

Murtagh states however that *'vertebrogenic pain syndromes have not been emphasised in medical training.'* (67, 68)

Lewit has used the term vertebrogenic in recognition of conditions originating from the spine. (p. 33) He also discusses this etiological relationship with visceral disorders. (69)

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. (70)



There are sound physiological reasons for these clinical observations as have been outlined in such medical, chiropractic and osteopathic textbooks as:

- ▶ Lewit K. Manipulative therapy: musculoskeletal medicine. Oxford, UK: Butterworth-Heinemann; 2009:281-297
- ▶ Biedermann H. Manual therapy in children. Edinburgh, UK: Churchill Livingstone 2004;133-144,195, 295-297
- ▶ Murtagh J. General practice, 5e. North Ryde, Australia, 2012, 1535 pps
- ▶ Maigne R. Orthopaedic medicine: a new approach to vertebral manipulation. Springfield, MA
- ▶ Charles C Thomas. 1972:27, 164, 192-209, 390
- ▶ Gatterman MI. Foundations of chiropractic subluxation. St Louis: Mosby, 1995, 487 pps.
- ▶ Leach RA. The chiropractic theories. Principles and clinical applications. 3rd edn. Baltimore: Williams & Wilkins. 1994, 401 pps
- ▶ Haldeman S. Principles and practice of chiropractic. 3rd ed. New York: McGraw-Hill Medical: 2005, 1248 pps

The osteopathic author Greenman appears quite definite about the existence of vertebral disturbances when he states *'Therefore SD or somatic dysfunction should be considered synonymous to, but not superior to nomenclature for segmental dysfunction, subluxation dysfunction, osteopathic lesion, or when referencing non-spinal bone misalignment structural deviation. References to that nomenclature are intended to engender specificity of diagnosis or assessment and to assist the reader who may know that condition by only that certain name.'* (71)

In citing Paris (1979) and Schmidt (2008). the physiotherapists Smale and Rayner acknowledge the gate control mechanisms of pain through the *'biomechanical effects such as tissue lubrication or "correction of spinal joint subluxation"'* (72)

Internationally, the chiropractic subluxation is recognised by at least two government departments in the USA. The *US Medicare Office (Centers for Medicare and Medicaid)* recognises the term subluxation in relation to spinal care provided by chiropractors. The *US Agency for Healthcare Research and Quality* also recognise the vertebral subluxation in chiropractic practice, noted as the Trauma Diagnosis Codes M9911 – M99.19, and as an AHRQ Guideline. (73-75)

In 2003, the *US Department of Veterans Affairs (VA), Chiropractic Advisory Committee*, *'accepted public comments to assist in identifying issues and concerns regarding the development and implementation of a chiropractic health program within Veterans Health Administration (VHA).'* Under the Scope of Practice, it was stated that chiropractors provide *'... care for neuromusculoskeletal conditions including the subluxation complex.'* It also stated that *'Chiropractors must be allowed to use vertebral subluxations as a primary diagnosis when appropriate.'* Under the concluding section of B.4 Scope of Practice, it is stated that *'Subluxation is specifically mentioned in the statute as a unique area of chiropractic responsibility and authority and has been a long-standing element in federal health programs.'* (76)

In veterinarian practices the term subluxation was used more in a chiropractic sense at a conference in Germany. One course has presented material describing *Vertebral and Extremity Challenge* which allows the doctor to test for the presence of subluxations as well as determining the proper line of correction. Pelvic subluxation as defined in the basic certification course, is greatly expanded to define three types of pelvic categories. Methods for their diagnosis and correction are taught. Injury recall technique is a method to erase the neurological memory of past injuries which often interfere with normal healing, allowing subluxations to return. (77, 78, 79, 80)

## Discussion

The emergence of any new health profession may be identified by its unique title. Similarly, its uniqueness may be identified by its distinct use of particular terminology otherwise it could hardly

be regarded as being different to any other profession. Consequently, chiropractic has developed two particularly distinctive terms; the '*vertebral subluxation*' and the '*vertebral adjustment*'. As portrayed clinically and physiologically here, these two terms appear to have the potential to influence the ANS, and at times clinically signifies legitimate means of positively affecting a patients' inherent recovery powers by their clinical outcomes. (81, 82)

#### *The Vertebral Subluxation and Other Conditions.*

The concept that subluxations are the cause of disease has long been dismissed. It is only political agitators who raise that superficial furphy. That subluxations may be an acknowledged factor in a range of conditions is not only a chiropractic observation, but a medical, physiotherapy and osteopathic one as well. (83)

Some of the most significant research and one of the most significant publications on the influence of somatic structures on the autonomic nervous system is not a chiropractic or osteopathic text. It is a full text report on the extensive research conducted on neurophysiology from neurophysiologists in Japan. No formal research has been found which contradicts the fundamental principles and findings published by Sato and colleagues in the numerous papers on their findings. (84, 85)

Subluxations have been associated with a range of headaches of neck origin. Cervicogenic headaches are also listed in the WHO's ICD-10 and the medically recognised mediator with headaches is the autonomic nervous system. A *cervicocranial syndrome* is allocated as code M53.0. It would be imprudent to think that disturbance of the ANS ceases with headaches, when other areas may also be affected through this autonomic distribution. The 2013 edition of the *International Classification of Headache Disorders* (ICHD) classifies a *Cervicogenic Headache* as ICHD-3 code 11.2.1. This designation must now regard cervical subluxations officially as a '*medical*' term. (86,87)

Cailliet devotes a whole chapter to subluxation of the cervical spine and defines a subluxation as a derangement of the opposing joint surfaces, and just a degree of a luxation. (88 p.61) While acknowledging a wide range of potential neurological symptoms. (p. 37)

In 1970, Prof Stuart Butler reported on medical evidence by Braaf and Rosner. He stated that they averred that '*More than 90% of recurring headaches can be traced to mechanical derangement of the cervical or neck portion of the spine produced by injury.*' This finding did not appear to alter the standard medical approach in the amelioration of headaches. (89)

In recognition of acceptance of the subluxation terminology, a 2015 study in North America found that a majority of the 7,455 chiropractic students surveyed agreed or strongly agreed (61.4%) that the emphasis of chiropractic intervention in practice is to eliminate vertebral subluxations/vertebral subluxation complexes. A further 15.2% neutral, and only 23.3% disagreeing. It is suggested that '*modulation*' of vertebral subluxations may have attracted an even higher rate of agreement. (90)

Although many medical doctors accept, collaborate and in fact adopt chiropractic concepts, it is submitted that politically, these concepts are being adjudged critically by others where a traditional resistance to new concepts can be based on unsubstantiated opinion. This tends to disregard or ignore the medical citations presented here.

We would maintain that noxious somatovisceral reflexes (11, 91) are a key factor in cervicogenic headaches. (92) functional conditions such as vertebrogenic dysphagia, (93, 94) vertebrogenic dyspepsia, (95) infantile colic. (96) and certain cardiovascular changes. (6, 7. These represent published studies of potential pathophysiology examples associated with the subluxation complex. There are also rather extensive clinical phenomena noted by European medical doctors. (97)

Removing the term subluxation from the chiropractic lexicon would effectively be a form of containment and a step away from what the profession has established and has successfully stood by for over a century, and now supported within the literature.

## Conclusion

The evidence we have presented indicates that medicine, osteopathy, and physiotherapy have all used the term ‘*subluxation*’ in the chiropractic sense. However, the more appropriate, and inclusive descriptive term of vertebral subluxation complex is widely adopted in chiropractic and the WHO ICD-10. It would be most incongruous for chiropractic to move away from using subluxation when it is so well established.

A move to deny clarity to the essence of chiropractic may well affect the public image of the profession. As Hart states *‘Identifying the chiropractic profession with a focus on vertebral subluxation would give the profession uniqueness not duplicated by other health care professions and, therefore, might legitimatise the existence of chiropractic as a health care profession. An identity having a focus on vertebral subluxation would also be consistent with the original intent of the founding of the chiropractic profession.’* (82)

The term ‘*vertebral subluxation*’ has been in general use and understanding in the chiropractic profession as is ‘*chiropractic subluxation*’ and ‘*vertebral subluxation complex*’ (VSC). It is a part of the profession’s heritage.

Critics of concepts regarding subluxation offer no original evidence to support their case, and that appears to be just political opinion rather than providing evidence to substantiate their stand.

The evidence presented in this paper supports the contention that there would be no vertebrogenic symptoms associated with physiologically normal vertebral segments. The term designated by chiropractors to identify abnormal or pathophysiological segmental dysfunction is the vertebral subluxation.

It has been a part of chiropractic heritage for over 120 years.



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Rome PL, Waterhouse JD. Neurodynamics of vertebrogenic somatosensory activation and Autonomic Reflexes - a review. [Special collection, 13 papers]. Asia-Pac Chiropr J. 2021:1-4. URL <https://www.apcj.net/papers-issue-2-4/>.

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