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CLINICALEXPOSITION

Neuroplasticity and the Vertebral Subluxation Complex: A synopsis

Peter L Rome and John D Waterhouse

Narrative: This brief report provides an overview of the model of Chiropractic Neuroplasticity advanced by the Centre for Chiropractic Research at the New Zealand College of Chiropractic, a world-class research facility driven by dedicated researchers who are leaders in Chiropractic research.

We used an AI Bot to generate a view of the Neuroplasticity Model and found it to be consistent with the principles of Chiropractic.

We note with particular interest that critics of the Neuroplasticity Model and any association by Chiropractors with the Vertebral Subluxation Complex and its correction by the adjustment, delivered with intent by trained Chiropractors, remain unable to offer an alternative model.

Indexing terms: Chiropractic; Vertebral Subluxation Complex; Subluxation; Neuroplasticity; Neuroplasticity Model.

Editors note: This paper represents fair and transparent use of AI in scholarship and publication.

Introduction

Founded largely on the neurophysiological research by Haavik, Holt, Murphy, Niazi from the New Zealand CC Research Centre at New Zealand College of Chiropractic, (1) the following subluxation model involving neuroplasticity is principally drawn from our formation of the idea for this paper and then our creation of prompts for a freely available LLM AI assistant. We then reviewed the material that was generated and anchored it in the literature with appropriate citations. We accept full responsibility as authors of this paper for all that is stated.

'... Critics of the Neuroplasticity model and in particular of any association with the subluxation offer no alternative model ...'

Haavik Research is a team of chiropractors, scientists and digital specialists dedicated to helping people express their optimal potential. The members of this institute have produced some 145 papers which have been published in medical and chiropractic journals. These have been cited over 2,500 times. (2, 3)

The Chiropractic neuroplasticity model they promote suggests that spinal dysfunctions, known to us as subluxations and more fully as Vertebral Subluxation Complexes, disrupt normal sensory

feedback to the brain, which adapts to this flawed input by reorganising its structure and function. This process is called neuroplasticity.

Chiropractors accept that the Chiropractic adjustment aims to correct these dysfunctions, thereby restoring proper sensory input which may then lead to beneficial, lasting neuroplastic changes in the brain, improving sensorimotor integration, motor control, and overall function. (4)

Components of the Neuroplasticity model

Dysfunctional feedback

The theory posits that biomechanically disrupted spinal joints (subluxations) send incorrect sensory information to the brain, creating a maladaptive cycle. (5)

Brain adaptation (Neuroplasticity)

The brain, in its continuous effort to adapt and function optimally, reorganises its neural pathways in response to this incorrect sensory information. (6)

Chiropractic intervention

A Chiropractic adjustment aims to correct the subluxation and restore normal sensory response. Incorporating feedback to the brain. (7, 8)

Restored Function

With the corrected sensory input, the brain can then undergo positive neuroplastic changes, leading to improved central nervous system function and motor control. (9)

Evidence and applications

Neurological changes

Studies using techniques like Transcranial Magnetic Stimulation (TMS) and Somatosensory Evoked Potentials (SEPs) have shown that Chiropractic adjustments influence brain areas such as the primary somatosensory cortex, prefrontal cortex, and cerebellum. (10, 11)

Improved function

These changes can lead to better sensorimotor integration, motor learning, and even improved cognitive functions. (12)

Beyond pain

The model extends beyond just musculoskeletal issues, suggesting that neuroplastic changes from chiropractic care can also positively impact pain perception, mood, sleep, and quality of life.

Long-term care

Achieving significant neuroplastic changes requires consistent, long-term care, rather than sporadic adjustments, as the brain needs time and consistent signals to adapt and form new connections.(13 - 19)

The Vertebral Subluxation Complex is essentially a model, both current and historical, which successfully elucidates the signs, symptoms, and clinical outcomes noted as a result of segmental vertebral adjustments.

The ‘adjustment’ is a refined and specific form of manipulation with clearly defined technical parameters such as speed and applied forces.

Discussion

There are critics of the Neuroplasticity model and in particular of any association with the subluxation and its correction. It is important to note that no alternative model has been put forward by these critics to describe these clinical observations.

Even when Chiropractors speak of common neural associations such as cervicogenic headaches, sciatica, and intercostal neuralgia, the critics consistently fail to offer an alternative model.

From our perspective there is no anatomical or physiological reason that such neural disturbances should be limited to having similar influences or degrees of physiological influence on organs, muscles and vascular innervations as noted in published clinical findings.

Conclusion

In essence, the Chiropractic Neuroplasticity Model views Chiropractic adjustments as a stimulus that facilitates the brain's natural ability to adapt and improve its structure and function, ultimately enhancing health and performance.

John D Waterhouse
DC (ret), FACC
Melbourne

Peter L Rome
DC (ret), FICCS, FACC
Melbourne
cadaps@bigpond.net.au

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