

**Whiplash
Real or Not Real
A Review and New Concept**

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KEY POINTS FROM THIS CHAPTER:

- 1) Chronic whiplash is symptoms that persist for longer than 6 months; 50% of those who are injured in whiplash develop chronic symptoms.
- 2) Classic chronic whiplash symptoms include:
 - neck pain
 - headache
 - interscapular pain
 - paresthesias in arms/hands
 - dizziness
 - temporomandibular pain
 - visual symptoms
 - vestibular symptoms
 - cognitive problems
 - emotional/psychological disturbances
- 3) In some patients who experience an unexpected rear-end collision, the "symptoms persist for years."
 - An essential factor in chronic whiplash symptoms is the "unexpectedness of the accident."
 - "Whether or not the driver in a rear-end crashed car is aware of the impending collision is extremely important."
 - "The awareness or expectancy of the incoming collision is crucial in the whiplash process;" 70-80% of the patients suffering from chronic whiplash "were unaware of the incoming collision."
 - "A correlation exists between being unaware of the incoming collision and a poor recovery."
 - A crucial factor in determining the extent of a whiplash mechanism injury is the "expectancy of the incoming collision."
- 4) More women suffer from whiplash trauma than men, 1.5/1.
- 5) More women develop chronic whiplash symptoms than men 1.54/1.

- 6) A number of lines of investigation have documented the following injuries from whiplash mechanisms:
- #1 facet joint capsular ligaments
 - #2 paravertebral ligaments, including the anterior longitudinal ligament
 - #3 intervertebral disk
 - #4 dorsal root ganglion
 - #5 neck muscles: "fatty infiltration in the muscle is considered indicative of pseudo-hypertrophy, has been extensively demonstrated in chronic stages of whiplash by MRI studies"
- 7) Current diagnostic techniques cannot detect tissue damage in chronic whiplash patients. **[Important]**
- 8) "Standard imaging techniques such as radiography, computed tomography (CT), and MRI are inconclusive for the prognosis of the symptoms after a whiplash trauma."
- 9) PET imaging with inflammatory markers show chronic whiplash patients have persistent inflammation around the neck muscles as compared to controls.
- 10) The initial whiplash injury is an inertial retraction creating a non-physiological "S-shaped" cervical spine curvature, occurring while the entire cervical column is under compression. Whiplash injury occurs during the S-shaped phase and usually involves a subject who was unprepared for the incoming collision.
- 11) "Symptoms after a whiplash injury are the results of disturbed proprioceptive information from the neck." **[Key Point]**
- 12) There is a close interaction between neck proprioceptors/mechanoreceptors and with the brainstem controls of vision, vestibular, and somatosensory function.
- 13) Chronic whiplash symptoms are the "result of a mismatch between aberrant information from the cervical spinal cord and the information from the vestibular and visual systems, all of which are integrated in the mesencephalic periaqueductal gray and adjoining regions."
- 14) Upper cervical whiplash injury drives an alteration in proprioception/mechanoreception that can result in:
- alterations in pain perception
 - depressive-like symptoms
 - headaches
 - temporomandibular symptoms
 - dizziness
 - visual disturbances
 - alterations in postural control

15) "More than 30% of all the spino-PAG [periaqueductal gray] fibers originate from the C1-C3 spinal segments." [*This is probably why upper cervical chiropractic care can inhibit pain effectively in many different body regions*].

16) The group of neurons located between the superior colliculus and the ventrolateral PAG are involved in a number of individual and species survival functions, including:

- pain modulation
- micturition
- blood pressure
- fight-flight response [sympathetic nervous system]
- vocalization
- respiration
- mating behavior

17) "There is no clear evidence to support that compensation and its related processes are involved in the health of [whiplash-injured] patients."

18) These authors propose that chronic whiplash symptoms (nausea, dizziness, headache, neck pain, etc.) are due to an "injury-induced mismatch in the midbrain and other structures via the upper cervical cord to the mesencephalon on the one hand and the intact information from the vestibular and visual systems to the mesencephalon on the other hand." "The subsequent continuous imbalance may create a permanent hyperarousal of the brain, depending upon the strength of the cervical damage."

COMMENTS FROM DAN MURPHY:

This study supports the evidence that concentrating on pain control with drugs is misplaced in the whiplash-injured patient. The evidence continues to support that chronic whiplash occurs as a consequence of poor quality proprioceptive (mechanoreception) input from injured soft tissues into the central neural axis, and that management should be directed towards improving mechanical function of the injured (and often already repaired) soft tissues. This very much supports the chiropractic approach to management of chronic whiplash patients.

