



WHIPLASH UPDATE

Update on Low Impact Motor Vehicle Collisions — A Review Of Six Studies

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Whiplash-Associated Disorders in Frontal Impacts: Influencing Factors and Consequences

Traffic Injury Prevention

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Lotta Jakobsson, Hans Norm and Olle Bunketorp (The authors are associated with Volvo Car Corporation)

These authors performed an in-depth investigation of accidents using 24 occupants with neck symptoms. Their results show the complexity of whiplash-associated disorders (WAD) in frontal impacts with respect to factors that influence occurrence as well as duration of symptoms.

The key points noted in this article include:

1. Whiplash injuries occur in 12-24% of frontal impact collision riders.
2. Whiplash injury symptoms can include neck pain, neck stiffness, neck tenderness, all with or without musculoskeletal / neurological signs; and occasionally deafness, dizziness, tinnitus, headache, memory loss, dysphagia, and TMJ disorders.
3. There is no correlation between delta-V and initial symptom intensity.
4. In this study, the delta-V varied from about 3 mph to about 12 mph and moderate intense symptoms were seen throughout this entire range. This indicates that delta-V of the vehicle is not related to occupant injury.
5. Taller occupants tend to be more injured in collisions than shorter occupants.
6. Minor to moderate degenerative changes of the discs and/or facets are not associated with higher initial symptom intensity.
7. This article clearly documents a case where the patient had no pain on the day of collision, significant pain 20 days and 3 months after collision, and frequent pain at one year. This indicates that patients with no initial pain can develop significant pain that lasts for more than a year.
8. This article also documents a case where the patient had no symptoms for the first year after the collision, but then developed symptoms after 1 year that required treatment.
9. In frontal collisions, the best safety combination was being belted and having an air bag. Even though the crashes with belts and air bags were of quite high impact severity, none of the patients experienced intense or long-lasting neck symptoms.
10. In this study, 40% of the patients had symptoms that lasted more than one year. This adds to the evidence that a significant number of those in-

jured in motor vehicle collisions do not recover in a few weeks, and symptoms can extend for more than one year.

11. Arm symptoms from neck injury are related to a less favorable prognostic outcome.
12. "All of the cases with initial high symptom intensity had symptoms lasting more than 1 year." This indicates that initial severe symptoms are associated with a prolonged recovery.
13. Occupants in the same vehicle with the exact same delta-V can have completely different injury, symptoms, symptom intensity, and symptom duration.
This indicates that individual factors are more important than car-related factors in establishing injury, symptom intensity and symptom duration. **[Very Important]**
14. There is no single car-related factor that is responsible for symptom aggravation or duration.
15. The higher the initial symptom intensity, the longer the duration of symptoms the patient would have, indicating that initial pain intensity has prognostic relevance. **[Important]**

Whiplash: Fact or Fiction?

The American Journal of Orthopedics
January 2005

Jeff S. Silber, MD, Victor M. Hayes, MD, Jason Lipetz, MD, and Alexander R. Vaccaro, MD

These authors note that cervical sprain/strain or whiplash injuries are a common cause of acute and chronic musculoskeletal impairments and are ubiquitous after rear-end automobile collisions.

The key points noted in this article include:

1. Rear-end motor vehicle whiplash injuries "present a significant risk for permanent disability."
2. At least one third of rear-end motor vehicle whiplash injured patients do not resolve in six weeks and complain of chronic neck/arm symptoms.
3. About 15 million Americans currently have chronic whiplash symptoms.
4. Visual and auditory disturbances after whiplash may result from brain injury.
5. It is common for whiplash symptoms to be mild initially but then intensify within 48 to 72 hours.
6. NOTE THESE FOUR QUOTES:
 - 6A. "Any rotation of the head or neck at the time of impact increases the forces imparted

to the cervical facet joints and capsular structures, which are believed to be the source of neck pain."

- 6B. "Rotation of the head (pretorque) and neck position at time of impact increases the force imparted to cervical anatomical structures, especially the cervical facet joints and capsular structures."
 - 6C. "Just before a rear-end collision, drivers often rotate the head to look into the rearview mirror." This increases facet capsule strain leading to injury.
 - 6D. "Many patients with chronic neck symptoms reported having the head rotated at time of impact (before the collision), and such rotation creates pretorque to the facet joints," and increased facet capsular strain.
7. X-rays after whiplash injury are usually normal except for loss of lordosis and/or anterior widening of the prevertebral soft-tissue space.
 8. Whiplash can cause ligament injury or herniated nucleus pulposus.
 9. Flexion/extension lateral x-rays are used to rule out instability.
 10. Headrests decrease injury by 10%.
 11. Whiplash injuries have doubled since mandatory seat-belt laws were introduced because seat belts act as a fulcrum increasing injury to the neck.
 - 12) The cervical facet joints are particularly vulnerable to injury during a whiplash event, yet the injuries are rarely seen on x-rays.
 - 13) Each of the Quebec Task Force grades on whiplash has a requirement for more treatment and a worse prognosis for recovery. The most important distinction between Grade II to Grade III is to objectively document extremity muscle weakness. [One of the reasons I like the Myologic Diagnostic System (www.myologic.com) is because it objectively documents reduction of range of motion and muscle weakness using the 5th edition of the AMA Impairment Guides, which appropriately places whiplash injured patients in category Grade III. Quebec category Grade III requires more treatment and has a worse prognosis for complete recovery.]
 14. Cervical spine degenerative changes result in a poor prognosis for recovery.
 15. Whiplash injured patients are 3 times more likely to suffer from chronic neck and/or shoulder pain 7 years after an accident than are normal controls.
 16. 97% of patients who were injured in a whiplash accident and became pain free develop symptoms again when exposed to a second whiplash injury.
 17. Facet joints are innervated with a tremendous amount of mechanoreceptors and nociceptors that transmit joint proprioception and pain information.
 18. The atlanto-occipital joints, the atlantoaxial joints, and the C2-C3

joints are the primary pain generators of cervicogenic headaches.

19. Corticosteroid injections into the facet joints do not benefit chronic facet pain patients.
20. Whiplash injuries are true pathologic entities associated with significant morbidity, **[which indicates that they are not biosocial, they are organic].**
21. "Often, patients with whiplash symptoms have no objective findings and negative radiographic studies."

The Fluctuation in Recovery Following Whiplash Injury 7.5-year Prospective Review

Injury

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Pages 758-761

P.J. Tomlinson, M.F. Gargan and G.C. Bannister

These authors prospectively reviewed 42 patients with a whiplash injury at the time of injury, after 3 months, 2 years and a mean of 7.5 years. The range of neck movement, pain, its effect on lifestyle, and psychometric testing were also determined in each of the patients.

The key points noted in this article include:

1. The psychological symptoms suffered by whiplash patients are secondary to physical injury.
2. In this prospective study, 7.5 years after sustaining whiplash injury:
 - A. 29% of the patients had no symptoms.
 - B. 48% had mild symptoms that did not interfere with work or leisure.
 - C. 21% had intrusive symptoms that interfered with work and leisure and required continued treatment and drugs.
 - D. 2% had severe problems that required ongoing medical investigations and drugs. **This means that 71% of patients had symptoms 7.5 years after being injured, and 23% were suffering from significant symptoms.**
3. The symptoms of whiplash-injured patients fluctuate widely during a 7.5 year period.
4. It takes 2 years for whiplash symptoms to stabilize.
5. 64% of whiplash-injured patients have the same symptom severity at 7.5 years that they had at 3 months. Therefore, most [64%] whiplash-injured patients require intensive management during the first 3 months following injury if there is any hope of altering this long-term chronicity.
6. 17% of whiplash-injured patients will have symptom improvement between 3 months and 7.5 years.
7. 19% of whiplash-injured patients will have symptom deterioration between 3 months and 7.5 years.
8. "Between 3 months and 2 years symptoms fluctuate significantly and during this time any estimation of patients' prognosis will be unreliable." **[Very Important]**

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