

Whiplash Injury

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COMMENTS FROM DAN MURPHY

This is a review article that has 100 references. Two of the authors, Gordon Bannister and Martin Gargan are probably the most published individuals in history on long-term recovery outcomes of whiplash injuries.

FROM ABSTRACT

Most whiplash injury cases occur as the result of rear-end vehicle collisions at speeds of less than 14 miles per hour.

Patients present with neck pain and stiffness, occipital headache, thoracolumbar back pain and upper-limb pain and paraesthesia.

Over 66% make a full recovery and 2% are permanently disabled.

The outcome can be predicted in 70% after three months.

THESE AUTHORS MAKE THE FOLLOWING KEY POINTS:

- 1) Patients who sustain low-velocity whiplash injuries often will have more pain than those who sustain a fracture.
- 2) Patients who sustain low-velocity whiplash injuries often will have more psychological distress than those who sustain a fracture.
- 3) Although the term "whiplash" is often credited to HD Crowe's presentation of 8 injured cases as a result of rear-end vehicle collisions to the Western Orthopedic Association in 1928, the injury was recognized at least as early as 1882 when it was referred to as "spinal concussion" or "railway spine."
- 4) 90% of all road-traffic collisions occur at speeds less than 14 mph and "it is in these that whiplash occurs."
- 5) "Since the mid 1950s it has been recognized that the disability from whiplash is associated less with tire skid marks or the degree of vehicle damage than the effect of differential velocity on the head and upper torso."
- 6) Rear-end collisions are associated with more severe symptoms than collisions from any other direction.
- 7) Being rear-ended by a larger/heavier vehicle increases inertial injuries.

- 8) Because women have a thinner less rigid neck they have twice the whiplash-injury rate as men.
- 9) Head restraints that are too low act as a fulcrum and increase neck injury greater than no head restraint at all.
- 10) The best head restraints are high and positioned to reduce the posterior excursion of the head.
- 11) It has been known since human volunteer rear-end crash testing in 1956 that whiplash trauma produced a "cracking sound somewhere in the vicinity of the cervical spine and [the volunteer] suffered pain for some time afterwards."
- 12) All human volunteer rear-end crash tests at collision speeds of 5 mph have produced neck pain in a proportion of their subjects.
- 13) A change of velocity of 2.5 mph was sufficient to cause symptoms and a speed of 8.7 mph was needed to cause damage to a vehicle.
[The reference for this statement is friend and colleague Charles Davis, DC, in a 1998 article he published in the Journal of Manipulative and Physiological Therapeutics]
- 14) Only 15% of those involved in a rear-end collision will experience pain and go to the doctor.
- 15) Of those attending an Emergency Department:
 - 37% experienced immediate pain
 - 62-65% experienced pain within 12 hours
 - 90% experienced pain within 24 hours
 - 10% experienced pain after 24 hours
- 16) 50% of all cases of upper-limb pain and weakness occur more than a week after the injury.
- 17) 66% of women experience sufficient pain to take time off work for 2-69 days after the accident.
- 18) The most common whiplash-injury symptoms are:
 - Neck pain
 - Neck stiffness
 - Occipital headache
 - Thoracolumbar back pain
 - Upper limb paraesthesia
- 19) 5-9% of whiplash-injured patients develop subacromial impingement syndrome.
- 20) 38% of whiplash-injured patients will suffer irritation of the brachial plexus.

- 21) Symptoms are more prognostic than signs. **[Important]**
- 22) Signs that have prognostic value are, in order severity:
Neck tenderness < neck stiffness < neurological deficit.
- 23) Neurological deficits "rarely conforms to myotomes or dermatomes."
- 24) Processes of pain inhibition may cause upper limb weakness and impaired reflexes.
- 25) The longer the whiplash-injured patients symptoms last, the worse the prognosis.
- 26) In reviewing 15 studies on whiplash-injury outcomes:
Fewer than 50% of all patients made a full recovery;
4.5% were permanently disabled.
- 27) In Gargan and Bannister's (two of the authors of this paper) reports of consecutive series patients attending an Emergency Department showed:
66% of whiplash-injured patients fully recover
2% of whiplash-injured patients are disabled
- 28) 12% of whiplash-injured patients who became asymptomatic by 2 months after injury will have their symptoms return by 2 years after injury.
- 29) 7% of whiplash-injured patients who became asymptomatic by 3 months after injury will have their symptoms return by 2 years after injury.
- 30) Although some whiplash-injured patients will improve over 2.5 years after injury, "improvement is minimal after the first year."
- 31) The symptoms associated with a worse outcome are:
Rapid onset of pain (2 references)
Severe neck pain (3 references)
Acute hospital admission (1 reference)
Radiation of pain to the upper limb (7 references)
Headache (1 reference)
- 32) "The whiplash syndrome has both physical and psychological components."
- 33) The psychological components of whiplash injury include:
Impaired concentration
Somatoform disorder
Forgetfulness
Post-traumatic stress disorder
Driving anxiety

- 34) Whiplash-injured patients "have normal behavioural profiles early after their injury, but as the pain persists they develop psychological sequelae."
- 35) Whiplash-injured patients may develop depressive symptoms after 6 weeks.
- 36) The greater the whiplash-injured patient's pain is, "the worse is the psychological response."
- 37) In whiplash-injured patients, mood disorder after one year is twice that in the general population.
- 38) Factors significantly associated with a poor outcome independent of symptoms and signs include:
 Older age
 Lower educational achievement
 Part-time employment
 Pre-existing neck and low back pain
 Previous whiplash injury
- 39) In whiplash-injured patients:
 Clerical employees returned to work twice as quickly as manual workers
 Self-employed were half as likely to take time off, but they took much longer to recover fully.
- 40) Whiplash-injured patients are 5 times more likely to suffer from chronic neck pain than control populations.
- 41) The view that a whiplash-injured patient's symptoms will improve once litigation has finished "is unsupported by the literature." (5 references)
- 42) Litigation does not affect a whiplash-injured patient's rate of employment.
- 43) The more severe a whiplash-injured patient's pain the more likely they will engage in ongoing litigation.
- 44) In the general population, neck pain is not associated with cervical spondylosis or with advancing age. **[Important: this means that it is not appropriate to ascribe a whiplash-injured patient's neck pain to pre-injury spondylosis].**
- 45) Pre-accident spondylosis doubles the probability of developing neck pain from a motor vehicle collision. [This suggests that pre-accident spondylosis reduces the ability of joints to handle the imparted forces, increasing injury and symptoms].
- 46) "Patients whose necks are spondylotic at the time of their accident have an incidence of pain of 53% after two years."

47) "Patients who sustain a whiplash injury in their third decade and undergo radiography ten years later show a level of cervical spondylosis which is typical of necks 15 years older." **[Important: whiplash injury accelerates cervical spondylosis by 15 years].**

48) MRI disc degeneration rates are the same in symptomatic and asymptomatic populations. **[Important: again, this indicates that it is not appropriate to ascribe a whiplash-injured patient's neck pain to pre-injury spondylosis].**

49) These authors downplay the significance and quality of the biosocial whiplash studies. They claim that when reviewing the most referenced biosocial whiplash studies that "a significant minority of patients who sustain a whiplash injury continue to experience long-term symptoms."

50) "For an acute whiplash injury, a soft cervical collar is less effective than normal activity, physiotherapy or Maitland's manipulations."

51) "The use of the soft cervical collar gives worse results than that of no treatment at all, but is still widely prescribed."

52) 17% of whiplash injured patients who become asymptomatic will have a relapse of symptoms within 3 months.

53) "Overall, treatment for a late [chronic] whiplash injury is relatively ineffective." [Interestingly, two of these authors (Bannister and Gargan) have published two studies on the chiropractic treatment of late whiplash injury with outstanding (74-93% improvement) results:

Chiropractic treatment of chronic 'whiplash' injuries
Injury
Volume 27, Issue 9, November 1996, pages 643-645

"The results of this retrospective study would suggest that benefits can occur in over 90% of patients undergoing chiropractic treatment for chronic whiplash injury."

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A symptomatic classification of whiplash injury and the implications for treatment
The Journal of Orthopaedic Medicine
Volume 21(1), 1999, pages 22-25

"Chiropractic is the only proven effective treatment in chronic [whiplash] cases."