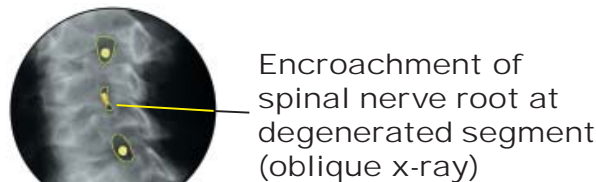
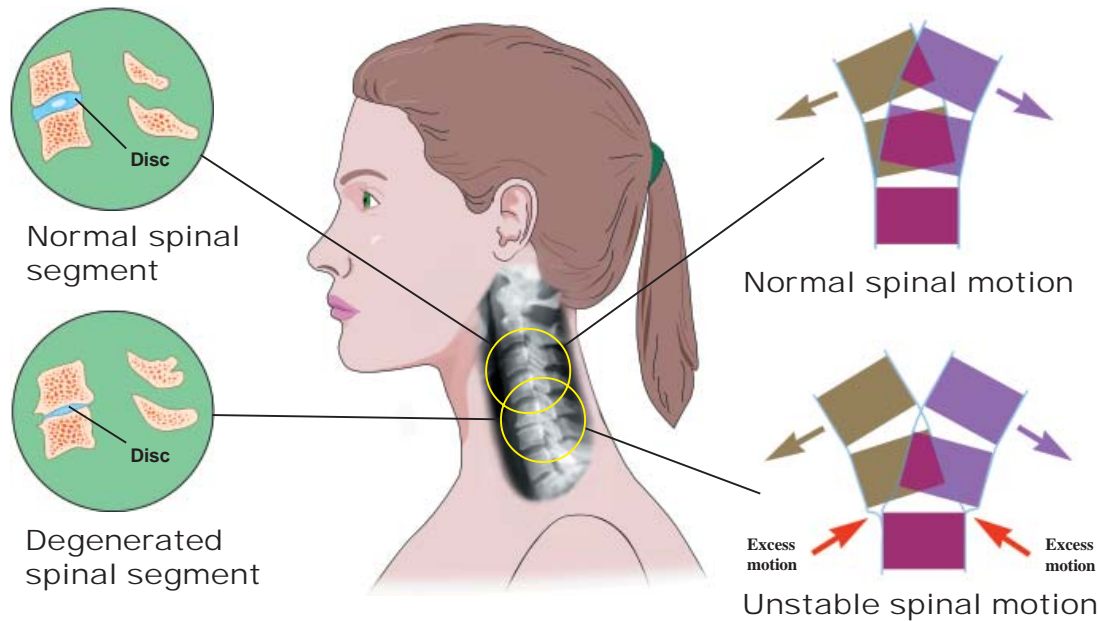


Prognosis of Whiplash Injuries



3 years after injury



20 years after injury

Risk factors for injury or poor outcome:

- Head turned
- Prior injury
- Prior headaches
- Prior neck pain
- Inadequate HR
- Poor position in car
- Arthritis
- Advanced age
- Disc disease
- Shoulder harness
- Rear impact
- Non-failure of seat
- Female gender
- Non-awareness

Prognosis studies

| Authors | Date | (n) | Type Collision | Length of Follow-up (yrs) | Chronic (%) |
|------------------------------------|------|------|----------------|---------------------------|-------------|
| Gotten | 1956 | 100 | Mixed | >1 | 46 |
| Macnab ¹ | 1964 | 266 | Mixed | >2 | 45 |
| Hohl | 1974 | 146 | Mixed | >5 | 43 |
| Ellertsson et al. ² | 1978 | 100 | Rear | 1.5 | 12 |
| Norris and Watt ³ | 1983 | 61 | Rear | 2 | 44-90 |
| Ebbs et al. | 1986 | 137 | Mixed | 1 | 26 |
| Deans et al. | 1987 | 137 | Mixed | 1 | 26 |
| Miles et al. | 1988 | 73 | Mixed | 2 | 29 |
| Maimaris et al. | 1988 | 102 | Mixed | 2 | 34 |
| McKinney ⁴ | 1989 | 167 | Mixed | 2 | 23-46 |
| Pearce | 1989 | 100 | Mixed | 1 | 15 |
| Hodgson and Grundy | 1989 | 40 | Mixed | 10-15 | 14-62 |
| Hildingsson and Toolanen | 1990 | 93 | Mixed | 2 | 58 |
| Olsson et al. ⁵ | 1990 | 33 | Rear | 1 | 41 |
| Pennic and Agambar | 1990 | 135 | Mixed | 0.5 | 13 |
| Watkinson et al. | 1991 | 35 | Rear | 10.8 | 86 |
| Kischka et al. ⁶ | 1991 | 52 | Mixed | >2 | 44; 61 |
| Radanov et al. | 1991 | 78 | Mixed | 0.5 | 27 |
| Ettlin et al. ⁷ | 1992 | 21 | Mixed | 2 | 35; 41; 29 |
| Parmar and Raymakers | 1993 | 100 | Rear | 8 | 55 |
| Robinson and Cassar-Pullicino | 1993 | 21 | ? | 10-19 | 86 |
| Hildingsson et al. ⁸ | 1993 | 38 | Mixed | >1 | 45; 34 |
| Radanov et al. ⁹ | 1993 | 97 | Mixed | 0.5 | 27 |
| Radanov et al. ⁹ | 1993 | 98 | Mixed | 0.5 | 32 |
| Ono and Kanno ¹⁰ | 1993 | ? | Mixed | ? | 15-20 |
| Gargan and Bannister ¹¹ | 1994 | 50 | Rear | 2 | 62 |
| Ryan et al. | 1994 | 29 | Mixed | 0.5 | 66 |
| Jónsson et al. | 1994 | 50 | Mixed | 5 | 32 |
| Radanov et al. | 1994 | 117 | Mixed | 1 | 24 |
| Di Stefano et al. ⁹ | 1995 | 117 | Mixed | 2 | 18 |
| Spitzer et al. ¹² | 1995 | 3014 | Mixed | 6 | ? |
| Radanov et al. | 1995 | 117 | Mixed | 2 | 18 |
| Borchgrevink et al. | 1996 | 345 | Rear | >2.5 | 58 |
| Mayou and Bryant | 1996 | 57 | Mixed | 1 | 49 |
| Pettersson et al. ¹³ | 1997 | 39 | Mixed | 2 | 15/44 |
| Karlsborg et al. | 1997 | 39 | Mixed | 0.6 | 71 |
| Gargan et al. | 1997 | 52 | Rear | 2 | 64 |
| Voyvodic et al. | 1997 | 29 | ? | 0.5 | 62 |
| Borchgrevink et al. ¹⁴ | 1997 | 88 | Mixed | 1 | 28 |

1 Actual percentage between 45 and 83.

2 Very little data provided.

3 Three groups: ranged from 44-90% still symptomatic.

4 A trial of mobilization therapy only.

5 % based on 29 patients who were injured.

6 Neck pain=44; headaches=61.

7 Neck pain=35; headaches=41; cognitive problems=29.

8 All symptoms=45; visual symptoms=34.

9 Cognitive symptoms.

10 Statistics from Auto Insurance Rating Association of Japan. Reported as "prolonged symptoms."

11 48 at one year; 62 at two years.

12 97% "recovered" at 1 year; recovered defined only as returned to work.

13 15% had daily symptoms; 44% non-daily.

14 Of rear impacts, 48% symptomatic at 6 mos.

Mean mixed=39%

Mean rear=56%

