Work-related Musculoskeletal Disorders of the Neck, Back, and Upper Extremity in Washington State, 1995-2003

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WORK-RELATED MUSCULOSKELETAL DISORDERS OF THE NECK, BACK, AND UPPER EXTREMITY IN WASHINGTON STATE, 1995 - 2003

SUMMARY

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OBJECTIVES We report the frequency, incidence rate (number of new claims per 10,000 full-time equivalent employees FTEs, CIR), severity rate (number of lost days per 10,000 FTEs, SR) cost, lost time and industry distribution of work-related musculoskeletal disorders (WMSDs) in Washington State in order to monitor and help focus prevention efforts by business, labor and government.

METHODS In the current study we examined State Fund workers' compensation claims for general and selected specific hand/wrist, elbow, shoulder, neck and back disorders in 1995-2003. We examined the Self-Insured closed compensable (four or more losttime days) claims data for general categories because diagnostic codes (ICD-9) were unavailable. We used a prevention index (PI) to rank industries by taking the average rank by incidence rate and rank by number of claims. We used the North American Industrial Classification System (NAICS) codes for industry for national comparison purposes. There was minor adjustment in the method for identifying the appropriate NAICS per claim compared to previous years. We used the Washington State Industrial Risk Classes (WIC) to reflect workers' compensation classes.

The focus was on non-traumatic soft tissue musculoskeletal disorders. These musculoskeletal disorders, when caused or aggravated by work activities, (for example, exposures to frequent or heavy manual handling, awkward postures, forceful or repetitive exertions) are referred to as Work-related MSDs or WMSDs. The lower extremity is not included in this report. We also included individual characteristics of gender, age and body mass index identified in the claims data to explore potential interactions with industry and WMSDs.

RESULTS Between 1995 and 2003 there were more than 50,000 State Fund and Self-Insured workers' compensation claims for WMSDs per year in Washington State.

There were 354,770 State Fund accepted claims for WMSDs of the neck, back and upper extremity resulting in:

- $3.6 billion in direct costs
- 27% of all State Fund-accepted claims
- 35.5% were compensable (four or more timeloss days) versus 23.7% of all claims
- Average claims incidence rate (CIR) of 282.7 claims and severity rate (SR) of 17,091 days per 10,000 full-time equivalent employees (FTEs)
- Average compensable claims incidence rate of 100 per 10,000 FTEs
- Average of 188 timeloss days per compensable claim
- 52.6% were claims for back disorders, 36.9% were for upper extremity disorders

The average number of State Fund WMSD claims for the neck, back and upper extremity was 39,419 per year and averaged $10,402 per claim.

There was a significant decrease in State Fund CIR for all claims, -5.4% per year over the study period ($p<0.001$). The CIR for WMSDs decreased -4.5% per year, slower than for all other claims (-5.7% per year) but not significantly different. Decreases in neck (-3.1% per year), and upper extremity (-3.1% per year) WMSD rates were significantly slower than all other claims ($P<0.05$) but there was no significant difference with back WMSDs (-5.2% per year) versus others. There was no

difference in median body mass index (BMI) for all compensable WMSD claims compared to all claims (BMI=26.6). Nor was there a difference in median time on the job (12 months).

For the Self-Insured, coded data was available only for compensable closed claims (four or more losttime days). There were 74,612 compensable closed WMSD claims (8,290 per year) resulting in:

- 45.7% of all self-insured compensable closed claims
- Average compensable CIR of 144 per 10,000 FTEs
- 48.2% were back disorders and 37.8% were upper extremity disorders

Since 30% of Self Insured claims are compensable, the estimated number of accepted claims per year would be 27,634.

The CIR for all compensable claims decreased -3.8% per year ($p<0.0001$). The WMSD compensable CIR decreased -3.9 % per year ($p<0.001$) from 1995-2003. This was not significantly different from all other claims combined.

We looked at several specific diagnostic codes (ICD-9) for WMSDs in the State Fund and found:

For **sciatica**, there were 7,084 accepted claims (787 per year), with a CIR of 5.6 and SR of 1,817.9 days per 10,000 FTEs, they were extremely costly:

- $62,237 per claim on average
- 77.8% were compensable with an average time loss of 483 days
- The CIR increased 1% per year, differing from all other claims rates by 5.6% per year ($p<0.0001$)

For **rotator cuff syndrome**, there were 21,129 accepted claims (2,348 per year) with:

- An average CIR of 16.7 claims and SR of 2,080.5 days per 10,000 FTEs
- Average cost of $27,689 per claim
- 60.8% were compensable with an average time loss of 296 days
- The CIR increased 2.6% per year over the study period ($p<0.0001$), differing from all other claims rate by 7.7% per year ($p<0.0001$).

For **epicondylitis**, there were 14,205 claims (1,578 per year) with:

- An average CIR of 11.3 claims and severity rate of 498.0 per 10,000 FTEs
- Average cost of $10,790 per claim
- 41.7% were compensable with an average time loss of 246 days
- There was no significant decrease in CIR, -0.7% per year, over the study period, significantly slower than other claims ($p<0.001$).

For **carpal tunnel syndrome**, there were 27,067 claims (3,007 per year) with:

- An average CIR of 21.5 claims and SR of 2,021.5 days per 10,000 FTEs
- Average direct cost of $19,851 per claim 64.1% were compensable
- Average time loss was 232 days
- The CIR decreased significantly (-2.4% per year, $P<0.0001$), but significantly slower than all other claims ($p<0.001$). Compensable carpal tunnel syndrome claimants had both higher median BMI (27.9) and median months on the job (24) than for those with other specific diagnoses examined.

For **hand/wrist tendinitis**, there were 20,499 accepted claims (2,278) per year with:

- An average CIR of 16.3 and SR of 1,035.2 per 10,000 FTEs
- Average cost of $12,021 per claim
- 40.3% were compensable with an average time loss of 238 days
- The CIR decreased significantly over the study period, -2.6% per year ($p<0.0001$) but significantly slower

per year than all other claims combined (P<.05).

We used the Prevention Index (PI) to identify industries with the greatest impact of WMSDs. Industries are listed in rank order by the number of claims and by the rate of claims. The PI is the average of the two ranks for each industry. An industry therefore is high on the PI if it has a relatively high number of claims and a relatively high CIR.

In the State Fund, Construction, Manufacturing and Health Care sectors ranked first, second and third on the PI. Among the Self-Insured, Health Care, Transportation and Warehousing, and Public Administration were top sectors.

We calculated the PI for industries classified by their 4-digit NAICS codes and also calculated a rate ratio for each industry by comparing the CIR for each industry with the overall state CIR. A rate ratio of 3, for example, means that the rate for that industry is 3 times the overall state rate.

The top 12 industries for <u>combined State Fund and Self-Insured</u> compensable WMSDs were:

1. **Couriers** (NAICS 4921) RR=4.5
2. **Foundation, Structure & Exterior Building Contractors** (NAICS 2381) RR=2.6
3. **Scheduled Air Transportation** (NAICS 4811) RR=3.3
4. **Nursing Care Facilities** (NAICS 6231) RR=2.5
5. **General Freight Trucking (**NAICS 4841**)** RR=2.4
6. **Residential Building Construction** (NAICS 2361) RR=2.0
7. **Building Finishing Contractors** (NAICS 2383) RR=2.3
8. **Community Care Facilities for Elderly** (NAICS 6233) RR=2.4
9. **Waste Collection** (NAICS 5621) RR=3.4
10. **Services to Buildings & Dwellings** (NAICS 5617) RR=1.9
11. **General Medical & Surgical Hospitals** (NAICS 6221) RR=1.7
12. **Specialized Freight Trucking** (NAICS 4842) RR=2.5

We also looked at industry by using the Washington Industrial Classification (WIC) codes. These codes are used for industrial insurance purposes and they code industries by similar processes and exposures. While in general the results are similar to the NAICS analysis, there are some high-risk industries not otherwise identified.

Top 12 Industries for WMSDs by Prevention Index and Washington Industrial Classification (WIC)

Rank	State Fund WIC	Rate Ratio	Self-Insured Compensable WIC	Rate Ratio
1	6108 Nursing Homes	3.9	1101 Parcel Package Delivery	4.7
2	0507 Roofing	4.9	6802 Airlines, Ground Crew	4.9
3	0510 Wood Frame Bldg Construct	2.8	0803 Cities – all other Employees NOC	2.7
4	2903 Wood Products Mfg	2.9	1404 Bus Companies	3.4
5	7114 Temp Help – Assembly	4.8	6104 Schools, all other Employees	2.3
6	6907 Moving Companies	5.3	6402 Supermarkets	2.1
7	2105 Beer Distributors	3.9	1102 Trucking, NOC	2.9
8	0518 Building Const NOC	2.9	7104 Temporary Help Admin. Staff	16.1
9	0540* Wallboard Installation	4.5	6801 Airlines, Flight Crew	4.3
9	4305 Garbage Collection	3.9	6904 Fire Fighters	2.8
10	7201 State Health Care Facilities	2.9	1405 Ambulance Service	7.9
11	1101Parcel Package Delivery	2.4	6602 Janitorial Service	3.4
12	0306 Plumbing	2.6	2102 Warehouses, NOC	1.9

NOC = Not Otherwise Classified All Other Employees = Groundskeeping, Maintenance, etc.
Temp Help – Administrative in Self-Insured also has temporary assembly and machine operator claims.
* Consolidated Discounted and Undiscounted Classes.

Men and women did not have the same WMSD experience by age group and industry sector. For men, CIRs tended to peak between 30-49 years while mean lost days increased with age group. For women, there was no clear CIR pattern. Time loss days tended to peak at 40-59.

Conclusions Work-related musculoskeletal disorders continue to be a large and costly problem in Washington State. The incidence rates for some WMSDs are decreasing; in some cases, the rate is stable (epicondylitis) or increasing (rotator cuff syndrome, sciatica). The highest risks are in industries characterized by manual handling and forceful repetitive exertions. Temporary Agency workers appear to be at particularly high risk.

These overall estimates of the burden of WMSDs are most likely an underestimate because the lower extremity is not included, there is evidence of under-reporting of these kinds of disorders in the literature, and the indirect costs to the employer, employee and society are not included.