

Workplace Health and Safety Bulletin



Musculoskeletal Injuries – Part 1 Alberta Injury Statistics and Costs

This is the first in a six-part series of Safety Bulletins dealing with musculoskeletal injuries.

Musculoskeletal injuries, or MSIs, are referred to by a variety of different names. These include repetitive strain injuries (RSIs), repetitive motion injuries, cumulative trauma disorders (CTDs), work-related upper limb disorders (WRULDs), and others. In each case, the name is used to describe injuries of the bones, joints, ligaments, tendons, muscles, and other soft tissues.

MSIs also have some more familiar names. Tennis elbow, for example, is an MSI that affects some tennis players. Painful elbow pain results from the repetitive swinging of a tennis racquet. Tennis elbow is also experienced by workers who use arm movements similar to those used by tennis players. Other MSIs have names that indicate the type of work that is being performed e.g. carpet layer's knee, letter carrier's shoulder, or pizza cutter's wrist. MSIs also have medical names such as carpal tunnel syndrome, thoracic outlet syndrome, and tendonitis.

The U.S. National Institute for Occupational Safety and Health (NIOSH) performed a comprehensive review of more than 600 scientific studies in 1997. That review concluded that there was evidence of a cause-and-effect relationship between workplace exposures to awkward body positions, forceful exertions, repetition, and vibration and disorders of the neck, shoulders, arms and hands.

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Employment and Immigration

The hidden injury, the hidden cost

MSIs don't kill workers, but they can have a devastating impact on their lives and livelihoods. A worker in pain loses the ability to concentrate, causing decreases in quality and productivity at work. A worker with muscle weakness may struggle to perform manual tasks, and may not be able to perform them at all. A worker with damaged nerves loses accuracy and placement in fine work, becomes clumsy and inaccurate, and may not respond quickly to danger. A worker with restricted movement may not be able to complete tasks or can only complete them by putting their body into awkward positions, positions that can cause additional problems.

At the end of the work day, all of these problems are taken home by the worker. Pain, weakness, sensory loss due to nerve damage, and limited movements can interfere with family responsibilities and relationships. Workers may not be able to prepare meals, maintain a clean home, perform household maintenance, or enjoy their hobbies. Parents may lose the ability to hold their children. These physical limitations can lead to emotional stress, damaged relationships, and a loss of self-worth.

Two types of MSIs

Overexertion injuries

Overexertion injuries involve tissues such as muscles, tendons, and ligaments. These tissues become damaged when they are subjected to a single traumatic event that exceeds their strength or range of motion. The result is a sprain, strain, or tear injury. Lifting, pushing, or pulling injuries are often of this type.

Overuse injuries

As the term suggests, overuse injuries occur when tissues are used too much and the body is unable to repair the damage. Repeated small injuries add up over time, taking hours, days, months, or years to appear. Gripping, reaching, bending, and twisting tasks are often associated with workplace overuse injuries. In moderation, these tasks are no more hazardous than identical activities performed at home. What makes them hazardous is the combination of endless repetition, the use of forceful exertions, performed while in an awkward body

position, and without rest or enough time for affected body parts to recover. This situation is more typical of work than any recreational activities or hobbies.

Differences between men and women?

There are differences in the incidence rates of MSIs between men and women. However, these differences may simply reflect differences in employment patterns, patterns in which women make up the majority of workers in certain types of jobs or occupations.

The workforce in highly repetitive data entry operations for example, is often mainly female. It is therefore difficult to separate the effect of gender from other social and economic factors.

Alberta injury statistics

Lost-time claims

According to data available through the Alberta Workers' Compensation Board (WCB), 35,440 lost-time claims (LTCs) were filed in the year 1999. A lost-time claim is a claim for an occupational injury that disables the worker beyond the day on which the injury occurred. Of these LTCs, 10,470 were classified by the WCB as overexertion and repetitive motion injuries. This means that of all the injuries sustained by workers at Alberta workplaces in 1999, MSIs, at 29.5 percent of the total, were the leading type of injury. Put another way, injuries and disorders caused by overexertion and repetitive motion are the leading cause of compensable lost-time cases in Alberta. Overexertion injuries on their own represent 26.2 percent of all injuries, far exceeding the next closest injury category, "struck by objects", which represented 14.2 percent of all injuries.

Tables 1 and 2 and their accompanying pie charts show the breakdown of injury claims based on the type of activity that caused or contributed to the injury.

Table 1 Classification of overexertion injuries

Type of Overexertion Injury	Number of LTCs	Percentage of Total
During lifting	4785	51.5%
During pushing or pulling of objects	1221	13.1%
During carrying, turning, or wielding objects	653	7.0%
During throwing of objects	84	0.9%
During unspecified activities	693	7.5%
Overexertion injuries not elsewhere classified	1857	20.0%
TOTAL	9,293	100%

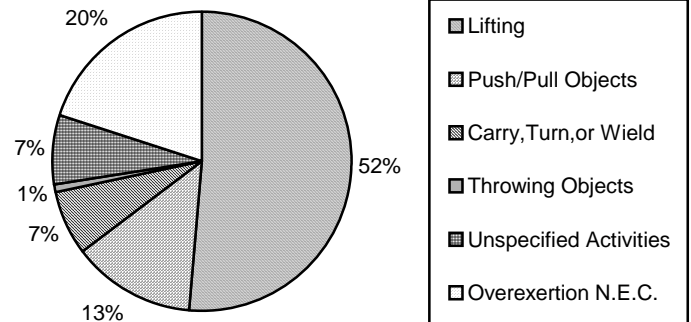
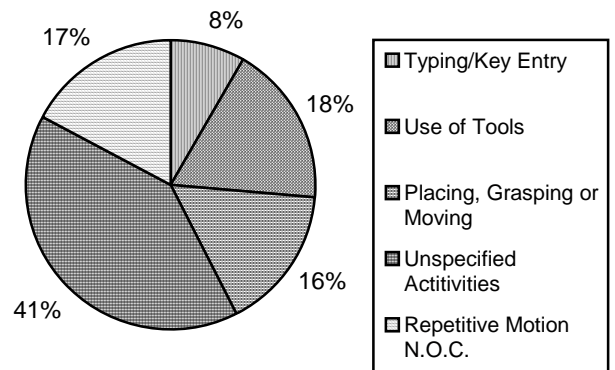


Table 2 Classification of repetitive motion injuries

Type of Repetitive Motion Injury	Number of LTCs	Percentage of Total
Due to typing or key entry (includes use of calculators and non-scanning cash registers)	99	8.4%
Due to repetitive use of tools	213	18.1%
Due to repetitive placing, grasping, or moving of objects, except tools	188	16.0%
Due to unspecified repetitive activities	474	40.3%
Repetitive motion injuries not elsewhere classified	203	17.3%
TOTAL	1,177	100%



All WCB MSI claims

Tables 3 through 6 present WCB overexertion and overuse injury claims data for various industries and occupations for the period 1996–2000 (as of May 10, 2000). Readers should note that this WCB “claims” data differs from the lost-time claims data reported in Tables 1 and 2.

“Claims” data includes both lost-time claims, new claims for which medical aid was provided without the loss of time from work, and recurrent claims that required further adjudication or case management. This data includes all those cases of workers who have sought medical attention for a condition but the condition did not result in the loss of time from work. Included among these cases are workers suffering mild to moderate injuries but who are still able to work, usually with some degree of pain or discomfort.

Tables 3 and 4 highlight the top 10 industries, sorted by highest claims costs, that are affected by overexertion and repetitive motion injuries. Table 5 shows which industries, based on total number of WCB claims, are the most prone to overexertion and repetitive motion injuries. Table 6 shows which occupations, based on total number of WCB claims, are most vulnerable to overexertion and repetitive motion injuries. To understand why these industries and occupations are affected more than others, readers are encouraged to read Part 2, 3 and 4 of this series.

Table 3 Overexertion injuries - top 10 industries sorted by highest total costs (1996-2000)

Industry	Total Costs	Number of Claims	Cost/Claim
Hospitals/Acute Care Centres	\$13,207,201.60	3,735	\$3,536
Trucking Service, General	\$11,257,324.44	2,751	\$4,092
Food Convenience Stores	\$7,264,299.20	3,304	\$2,198
Long Term Care Facilities	\$6,781,105.74	2,047	\$3,312
Cities	\$5,501,156.79	1,624	\$3,387
Steel/Metal Fabrication	\$5,399,893.07	1,590	\$3,396
Construction, Residential	\$4,386,688.82	715	\$6,135
Meat Processing	\$3,641,452.97	1,914	\$1,902
Mobile Equipment Operation	\$2,842,171.10	592	\$4,800
Auto Dealers	\$2,677,143.58	658	\$4,068

Table 4 Repetitive motion injuries - top 10 industries sorted by highest total costs (1996-2000)

Industry	Total Costs	Number of Claims	Cost/Claim
Meat Processing	\$2,763,545.28	1,042	\$2,652
Food Convenience Stores	\$2,585,752.64	675	\$3,830
Hospitals/Acute Care Centres	\$2,056,162.32	443	\$4,641
Cities	\$1,357,691.65	276	\$4,919
Auto Dealers	\$1,329,273.33	96	\$13,846
Steel/Metal Fabrication	\$1,047,685.37	155	\$6,759
Restaurant/Take-Out Food Services	\$1,017,251.25	242	\$4,203
School Boards	\$702,470.06	157	\$4,474
Construction, Residential	\$671,276.41	113	\$5,940
Wood Products Mfg	\$640,956.88	152	\$4,216

Table 5 Top 10 industries sorted by highest number of claims (1996-2000)

(a) Overexertion Injuries		(b) Repetitive motion injuries	
Industry	Number of Claims	Industry	Number of Claims
Hospitals/Acute Care Centres	3,735	Meat Processing	1,042
Food Convenience Stores	3,304	Food Convenience Stores	675
Trucking Service, General	2,751	Hospitals/Acute Care Centres	443
Long Term Care Facilities	2,047	Cities	276
Meat Processing	1,914	Restaurant/Take-Out Food Services	242
Cities	1,624	Hotels/Convention Centres	166
Steel/ Metal Fabrication	1,590	School Boards	157
Wood Products Mfg	1,197	Steel/Metal Fabrication	155
Restaurant/Take-Out Food Services	985	Wood Products Mfg	152
Department General Stores	963	Trucking Service, General	151

Table 6 Top 10 occupations sorted by highest number of claims (1996-2000)

(a) Overexertion Injuries		(b) Repetitive motion injuries	
Occupation	Number of Claims	Occupation	Number of Claims
Truck Drivers	4,337	Slaughterers/Meat Cutters/Canners/Curers/Packers	548
Labourers (not elsewhere classified)	2,709	Labourers, Food/Beverage Processing	518
Nursing Aids/Orderlies	2,324	Tellers/Cashiers	389
Longshoremen/Stevedores/Freight Handlers	1,978	Labourers (not elsewhere classified)	282
Nurses, Graduate, Except Supervisors	1,858	Chefs/Cooks	225
Sales Clerks, Commodities	1,785	Janitors/Charworkers/Cleaners	216
Shipping and Receiving Clerks	1,653	Sales Clerks, Commodities	206
Welders/Flame Cutters	1,602	Labourers, Services	205
Labourers, Material Handling	1,575	Truck Drivers	203
Personal Service Occupations (not elsewhere classified)	1,455	Secretaries/Stenographers	192

The cost of MSIs

The precise cost of work-related MSIs is unknown and very difficult to determine. Based on U.S. population data and estimated costs, the annual cost of MSIs in Canada is estimated to range from \$1.3 to \$2.0 billion annually. While this estimate reflects the situation nationally, perhaps the situation at the local employer level may be more relevant.

Any organization that determines the cost of its accident only in terms of compensation costs is only looking at a small percentage of its total costs. In fact, studies have shown that the cost of workplace injuries are estimated to be anywhere between 7 and 50 times the direct costs. Table 9 and 10, taken from a publication prepared by the Workplace Health, Safety and Compensation Commission of New Brunswick, help employers establish the real cost of MSIs and other workplace injuries. This exercise highlights the significance of indirect costs and then links the overall cost of MSIs to the dollar value of sales required to cover those real costs.

Table 9 Calculating total accident costs


		Your workplace
Direct cost of MSIs per year	\$1	(a)
Building, equipment and product damage, investigation time, and production delays and interruptions	\$5 minimum value	5 x (a) =
Hiring and training of replacement workers, overtime, and wages paid for lost-time from production	\$1 minimum value	1 x (a) =
TOTAL ACCIDENT COSTS	\$7	Sum column here


Table 10 Sales required to cover "Total Accident Costs"


Total Accident Costs	Profit Margin				
	5%	10%	15%	20%	25%
\$5,000	\$100,000	\$50,000	\$33,333	\$25,000	\$20,000
10,000	200,000	100,000	66,667	50,000	40,000
15,000	300,000	150,000	100,000	75,000	60,000
25,000	500,000	250,000	166,667	125,000	100,000
50,000	1,000,000	500,000	333,333	250,000	200,000
100,000	2,000,000	1,000,000	666,667	500,000	400,000
150,000	3,000,000	1,500,000	1,000,000	750,000	600,000
200,000	4,000,000	2,000,000	1,333,333	1,000,000	800,000
300,000	6,000,000	3,000,000	2,000,000	1,500,000	1,200,000
400,000	8,000,000	4,000,000	2,666,667	2,000,000	1,600,000
500,000	10,000,000	5,000,000	3,333,333	2,500,000	2,000,000
750,000	15,000,000	7,500,000	5,000,000	3,750,000	3,000,000
1,000,000	20,000,000	10,000,000	6,666,667	5,000,000	4,000,000

Other Safety Bulletins in this series


This six-part series of Safety Bulletins consists of the following titles:


 http://employment.alberta.ca/documents/WH/WH-PUB_erg017.pdf
 MSI – Part 1 – Alberta Injury Statistics and Costs – ERG017

 http://employment.alberta.ca/documents/WH/WH-PUB_erg018.pdf
 MSI – Part 2 – Symptoms and Types of Injuries – ERG018


 http://employment.alberta.ca/documents/WH/WH-PUB_erg019.pdf
 MSI – Part 3 – Biomechanical Risk Factors – ERG019


 http://employment.alberta.ca/documents/WH/WH-PUB_erg020.pdf
 MSI – Part 4 – Workplace Risk Factors – ERG020


 http://employment.alberta.ca/documents/WHS/WHS-PUB_erg021.pdf
MSI – Part 5 – Assessing Ergonomic Hazards – ERG021

 http://employment.alberta.ca/documents/WHS/WHS-PUB_erg022.pdf
MSI – Part 6 – Reducing Ergonomic Hazards – ERG022





A companion series specific to the lifting and handling of loads is also available. It consists of the following titles.

 http://employment.alberta.ca/documents/WHS/WHS-PUB_bcl001.pdf
Lifting and Handling Loads – Part 1 – Reviewing Issues – BCL001

 http://employment.alberta.ca/documents/WHS/WHS-PUB_bcl002.pdf
Part 2 – Assessing Ergonomic Hazards – BCL002

 http://employment.alberta.ca/documents/WHS/WHS-PUB_bcl003.pdf
Part 3 – Reducing Ergonomic Hazards - BCL003


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 - 📖 Workplace Health, Safety and Compensation Commission of New Brunswick. *Ergonomics Guidelines for Manual Handling*. Workplace Health, Safety and Compensation Commission of New Brunswick: September 1999.
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Workplace Health and Safety

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