MMH – Health Hazards – Fact Sheet



CAN MMH AFFECT YOUR HEALTH?

Manual material handling (MMH) is the most common cause of occupational fatigue and low back pain. About three of every four Canadians whose job includes MMH suffer pain due to back injury at some time. Such back injuries account for about one third of all lost work and even more than one third of all compensation costs. More important than financial cost is human suffering. Each year several thousand Canadian workers are permanently disabled by back injuries. Many others are unable to return to their former jobs. Their lives are disrupted.

All these facts make prevention of back injuries a crucial and challenging problem for occupational health and safety. This document focuses on preventing back injuries caused by MMH in the industrial workplace and is limited to the handling of inanimate objects.

What are the immediate health effects of MMH?

Immediate and short-term effects include accidental injuries and fatigue. Sharp or rough surfaces, and falling and flying objects are common causes of wounds, lacerations or bruises during MMH. The worker can also suffer these injuries by falling or by colliding with objects.

Fatigue is a common and expected effect of MMH. The effort required to perform MMH tasks uses up muscular energy. Where the pace of work is not too high, workers can find enough time between individual tasks to recover their energy, and work can be resumed and continued safely throughout the whole shift. On the other hand, a fast pace of work shortens the time between tasks and does not allow the workers to restore their energy. As a result, workers who try to maintain such a fast pace may become increasingly tired as the shift progresses. Recent development in research on the causes of back injury shows that even a moderate pace of lifting, not necessarily at the maximum lifting limit, if maintained for a prolonged time without breaks rapidly decreases workers' lifting ability by speeding up their fatigue. Fatigue not only causes instant and obvious discomfort but its effects add up over time. For that reason, fatigue can also contribute to serious injuries to the musculoskeletal system. These injuries can later develop into chronic conditions that can become difficult to treat effectively. Additionally, fatigue decreases workers'

alertness, making them more likely to act without due caution. This, in turn, increases their risk for accidents.

What are the long-term effects of MMH?

More serious problems related to MMH are the long-term health effects – chronic back pain.

Back pain can result from various causes. The most common causes are strains and cramps in the back muscles. Back pain can also result from tears in the tendons connecting the back muscles to the spine, or from sprains and tears in the ligaments interconnecting the vertebrae (bones of the spine). Less frequently, it arises from direct damage to the vertebrae or the discs that separate them.

A worker can sustain a back injury from a single episode such as lifting too heavy a load, slipping and falling, or receiving a blow to the back. However, most often it is not the single episode that causes back injury. It is the repetition, as in manual handling, that contributes most to the occurrence of injuries. Performing MMH tasks continually, even at a moderate intensity, will cause mechanical stress to accumulate in the worker's back, increasing the likelihood of injury. Eventually, even a mild effort in MMH can result in back injury and disabling back pain. Recovery from back injuries can take a long time and further injury may occur, making the problem worse.

Which work factors contribute to back injury during MMH?

Work-related factors include the weight of the load lifted, the range of the lift, the location of the load in relation to the body, the size and shape of the load, distance and duration the load is carried, and the number and frequency of lifts performed. Excessive bending and twisting also increase the risk for back injury.

For most workers, lifting loads over 20 kilograms results in an increased number and severity of back injuries. While the weight of the load is the most obvious factor, it is not the only one that determines the risk of injury. The location of the load is also important. A load lifted far from the body imposes more stress on the back than the same load lifted close to the body. A bulky object is harder to lift than a compact one of the same weight because it (or its centre of gravity) cannot be brought close to the body. Lifting a bulky object also forces a worker into an awkward and potentially unbalanced position. The preferred range for lifting is between knee and waist height. Lifting above and below this range is more hazardous.

How often the worker performs MMH tasks, and for how long, are extremely important factors. Frequently repeated and long-lasting tasks are the most tiring and therefore the most likely to cause back injury. Highly repetitive MMH tasks also make the worker bored and less alert. This, in turn, can affect safety. Workers need rest breaks in preventing excessive fatigue. Frequency and duration of rest breaks are important factors to be considered.

Poor layout of the workplace also increases the risk for injury. For example, shelving that is too deep, too high or too low causes unnecessary bending or stretching. Lack of space to move freely increases the need for twisting and bending. Unsuitable dimensions of benches, tables, and other furniture force the worker to perform MMH tasks in awkward positions that add stress to the

musculoskeletal system. Similar stressful body movements occur where work areas are overcrowded with people or equipment.

Training is a very important component to back injury prevention. Workers must be educated about correct lifting techniques for the tasks they do. New employees, those changing jobs, or those returning to work need to know the correct techniques and the dangers of not lifting correctly before beginning their job tasks.

Sometimes specific job tasks require wearing the personal protective equipment. These may hinder movement while lifting and cause injuries. Be sure that a job hazard analysis is performed and these restrictions have been addressed.

Tasks that involve manual handling exceeding the worker’s physical capacity and a poor workplace layout are the most common causes of back injuries. Physical capability includes elements such as gender, physical size, age, pregnancy and any previous injury.

Are there environmental factors that contribute to back injury?

Temperature and humidity affect the worker performing MMH. When it is too hot and too humid, the worker tires more quickly and becomes more susceptible to back injury. On the other hand, cold temperatures decrease the flexibility of muscles and joints. This stiffness also increases the likelihood of musculoskeletal injuries.

Inadequate lighting in the work area indirectly affects the worker performing MMH, particularly where the precise placement of handled objects is important. In compensating for poor visibility the worker often must handle objects in an awkward position for extended periods of time. Poor lighting on steps and stairways, ramps, and loading docks increases the potential for accidents resulting in back injuries. By misjudging distances, the height of steps, or ramp angles the worker can easily lose balance and fall while carrying a load.

Whole body vibration alone can cause back pain. It imposes compression on the spine that gradually damages the discs between the vertebrae. Combining MMH with vibration multiplies the risk for injury.

Are female workers at greater risk for back injury?

The capacity to perform MMH varies considerably among individuals. In general, the lifting strength of women as a group is less than that of men. However the individual ranges of strength are wide. This means that some women can safely handle greater loads than some men. Therefore, discrimination against women for MMH is not justified. In a situation where selection is the only way to minimize the possibility of injury, women and men should be given an equal opportunity of being selected for the job. However there are certain working conditions that even alone and more particularly when combined with MMH create greater health hazards for women. Owing to body composition and structure, women are less tolerant of heat and whole body vibration. Such hazardous conditions should be fully controlled and not serve as an excuse for gender discrimination.

Is age a risk factor for back injury?

Ageing diminishes strength. Since the rate of decline varies greatly with the

individual, discrimination against older workers solely on this basis is unjustified. Statistics show that back injuries among workers over 45 years of age are less frequent than among those between 20-45 years of age. Experience seems to counterbalance decreasing physical capacity. With experience come skills, dexterity and practical know-how for completing tasks, all of which are very important factors contributing to safe MMH. The unskilled, inexperienced worker is at greater risk in tasks that require skills in handling. On the other hand, the older, experienced worker is at risk in tasks requiring sheer physical strength.

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