



Strategies for Preventing Manual Handling Injury

Each year, injuries caused by manual materials handling are a significant cost to industry in terms of medical costs and lost productivity. According to recent Liberty Mutual Insurance Statistics, accidents and incidents resulting from manual materials handling cost more than \$10 billion in 2002.

The 2002 *Liberty Mutual Workplace Safety Index* ranks the leading causes of disabling workplace injuries and illness based on the direct costs associated with each injury type. The *Safety Index* is based on data from Liberty Mutual (the country's leading provider of worker's compensation coverage), the Bureau of Labor Statistics, and the National Academy of Social Insurance. The index notes that injuries and accidents caused by overexertion cost \$10.3 billion in 2002, and that injuries and accidents associated with repetitive motion cost \$2.4 billion. Injuries in both categories were defined as including injuries from excessive lifting, pushing, pulling, holding, carrying, or throwing of an object—issues that are all related to manual material handling.

In this brief article, I want to highlight ways to prevent these costly injuries from occurring. I will discuss three components of an overall preventative strategy: (1) job hazard analysis, (2) stretching, and (3) safe lifting techniques.

Job Hazard Analysis

The objective of a manual materials handling job hazard analysis is to identify ergonomic risk factors that cause cumulative trauma disorders and identify solutions that eliminate employees' exposure.

An analysis is warranted if there are two or more injuries recorded on the OSHA 300 Log. (An analysis is also called for if there are three or more "yes" answers on 25 percent or more of the ergonomic checklists completed as part of your job hazard analysis, and 25 percent of the samples collected in the body discomfort charts indicate a particular body part as a "three" or higher). NIOSH has many useful documents that can assist you in the analysis.

When analyzing tasks that require manual materials handling, select a person who is a fair representative of the work experience and whose performance parallels that of the group that performs the same function. Because the analysis is focused on manual materials handling, avoid using a worker with poor body mechanics or someone unfamiliar with proper procedures.

Once the manual materials handling job hazard analysis chart has been completed, the data is analyzed using a computer package such as the "MMH." The "MMH" program uses the latest NIOSH guideline, which offers the best compromise between epidemiological, biomechanical, physiological, and psychophysical criteria. Other programs based on NIOSH guidelines also exist. Contact NIOSH for further information (call 800-35-NIOSH or visit www.cdc.gov/niosh/homepage.html).

The computer program will analyze the data and provide the recommended weight and force for the corresponding lifting indices for every task component. These recommendations are for the 90th percentile of the male population and the 75th percentile for females.

Task redesign is necessary if any one, or any combination, of the three task elements exceed established limits for the number of significant body motions present in the task. Other factors are the number of back injuries the task has caused and whether the actual weight lifted is greater than the recommended weight.

Because of the number of task variables that can modify risk during manual materials handling, there are no simple or quick solutions. The key to ergonomic redesign is eliminating or reducing the three primary risk factors—force, repetition, and body posture.

The manual materials handling job hazard analysis chart and "MMH" computer program can provide guidelines for determining the amount of weight to be handled, the frequency with which it is handled, and how it is handled. By properly utilizing the technical tools available, you can help reduce the ergonomic risk factors associated with manual materials handling jobs.

Stretching

A second component of a preventative strategy is proper stretching. Stretching before and during work will greatly reduce manual material handling injuries. The tasks performed in routine manual materials handling require skill, strength, and flexibility—abilities enhanced by stretching. Stretching warms muscles so they can move more freely and generate more force with less chance of injury. It helps make employees better able to meet the demands of the job.

Stretching can be done at home prior to work or after work at the end of the day. A thorough stretching routine should include:

- Shoulders
- Lower back
- Sides
- Quads
- Hamstrings

When performing any type of stretching, individuals are advised to slowly stretch each muscle group. They should hold each stretch for 12 to 15 seconds and complete each stretch three times. Stretching should be done a few times each day to keep muscles loose and warmed up. If a worker feels discomfort, he or she may be stretching too far.

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In addition to stretching, employees should focus on cardiovascular and abdominal muscle conditioning. This will help individuals to avoid injuries, have more energy, and be more efficient in general.

Safe Lifting Techniques

Safe lifting techniques are the third component in a preventative strategy for eliminating injuries associated with manual materials handling. To reduce neck, back, and shoulder injuries, try to have workers keep heavier objects at waist level. This will help to avoid excessive lifting of heavy objects from the floor or overhead. When heavier objects must be loaded at floor level to keep the load from shifting or toppling over, it is vital employees use proper lifting techniques.

Safe and proper lifting techniques involve the following steps. When lifting or lowering product, employees always should face their load. Have them align their feet, hips, and shoulders and place their feet a little wider than shoulder length apart. Individuals should use the thigh muscles, not the back. Have them keep the product close to their bodies. A load held at arm's length from the body puts 10 times as much stress on the back. Have workers use both hands to hold the load.

When lifting, it's very important that employees maintain the natural S-shape of their back and spine. Instruct all employees to lift only what they can safely handle. Two lighter lifts are better than one heavy lift. Workers should not twist when lifting the object. Teach all employees to survey their surroundings for potential hazards while lifting. Finally, teach your workers to identify areas where they can minimize lifting and bending.

Conclusions

The above constitutes three highly effective measures that can be taken to eliminate injuries related to manual materials handling. In addition to the three primary steps discussed above, there are other measures that can be taken and employed to prevent injuries and accidents.

Rotating workers and their schedules can help prevent overexertion and exhaustion, thereby reducing the chance of injury. Maintaining a general wellness and health program for your workers also will encourage them to stay in optimal health and condition, resulting in lower incident rates. Finally, a solid back safety training program will greatly decrease the likelihood of injuries related to manual materials handling.

Source: Chris Vanhoven, *Occupational Health and Safety*, January 2004, p.40-42

Treat Your Body Right With the Right Chair

If you spend most of your workday sitting down, you can do your body a favor by sitting properly in a chair designed for maximum support and comfort.

"Over time, your body begins to pay a price if you spend hours at a time sitting in one position," says Iris Schencke, coauthor of *Ergonomic Living: How to Create a User-Friendly Home & Office*. "If your back, neck and shoulders are hurting, it may be because you're spending hours a day working at a high-powered computer while sitting in a broken down, incorrectly adjusted chair."

Ergonomic Checklist

An ergonomically designed chair— one that supports your back and the rest of your body comfortably— should have the following characteristics:

- **Waterfall edge.** A sloping edge to the front of the seat helps prevent numb legs, cold feet, varicose veins and calf cramps by relieving pressure on the blood vessels in the thigh. "The forward edge of the seat must slope downward gently," Ms. Schencke says. "Its too high if you can feel it pressing against your thighs."
- **Padding.** "Some padding is helpful, but too much can be a problem because it makes the chair difficult to get in and out of," she says.
- **Mobility.** The chair should roll effortlessly.
- **Armrests.** These allow your chair, not your upper back, to support the weight of your arms.
- **Proper seat depth.** "Too much seat depth can be a problem, especially in so-called executive chairs," Ms. Schencke says. "With your back well-supported, there should be enough room for a closed fist between the front edge of the chair and the back of your knee."

Adjust the Chair

"Taking the time to fine-tune your chair to fit you is extremely important," Ms. Schencke says.

Be sure to adjust the seat height so your feet are resting flat on the floor when you sit back. Adjust the seat angle so it tilts down slightly.

The back support should be aimed at the lower (lumbar) curve of the spine, and the armrests should be adjusted so your arms are at right angles when you are sitting up straight.

Consider using a footrest if you're sitting at a high desk or in a chair that can't be lowered. "Never let your feet dangle in the air," she says.

Sit Correctly

You'll maximize your comfort and reduce your risk of pain if you sit correctly and maintain good posture.

To Do So:

- Sit up straight with your back firmly against the chair.
- Keep your head up and avoid leaning forward. If you work long hours at a desk or keyboard, keep your chair close to the desktop to help maintain an upright position.

Get Up and Walk

Getting up and moving around as often as you can will help you avoid pain if you sit for long hours.

Source: Marjorie Brody, *Primary Agent*, February 2004, p.19-20