

Material Handling



Approximately 90% of all industrial activity involves material handling. Material is handled when transported to or from an operation and to or from points within individual workstations. Therefore, it is not surprising that material handling accounts for about two-fifths of all work injuries.

As a supervisor, the right material handling techniques can help you attain two goals: **Maximum production efficiency**, and **Minimum risk of injury**.

Material handling methods can be categorized as manual and mechanical. *Manual material handling* accounts for the majority of handling accidents. There are three types of body movement associated with most manual handling injuries: **Bending**, **Twisting**, and **Reaching Out**.

Lifting from below knuckle height—such as bending down to lift from the floor—produces a

large number of injuries in relation to how often this type of lift is done. Twisting is the second most frequent movement associated with manual handling injuries. Reaching out when handling bulky objects is also a problem because it imposes more stress on one side of the body than the other.

Manual handling consists of five basic tasks: lifting, pushing, carrying, lowering, and pulling.

Almost every manual handling task in industry combines two or more of these basic tasks. These contribute to both overexertion, which can result from handling too much weight once or a few times, and excessive fatigue, which can result from handling even light objects too often.

Low back pain is one of the most common and often the most costly injuries arising from manual material handling. Sprains, cuts and bruises make up the remainder. Using some of the techniques discussed here, the frequency of low back pain and other injuries can be reduced.

Mechanical material handling greatly reduces the exposure to low back pain and other injuries caused by overexertion. However, mechanical devices and equipment often introduce hazards themselves. For instance, injuries can occur from exposure to moving parts, nip points, falling loads and industrial truck collisions.

What You Can Do to Reduce Material Handling Accidents

Your responsibility as a supervisor is to create an environment that maximizes production efficiency and product quality from your department. Some supervisors think that safety measures reduce efficiency and product quality.

This is not true, especially in the area of material handling.

A well-designed job can be both efficient and safe. If you examine your department carefully and use the following concepts to redesign excessive jobs where necessary, two out of three low back injuries can be avoided.

Eliminate the task if possible – Lifting and lowering can be eliminated by using powered lift tables, work positioners, hoists and elevating equipment. Pushing, pulling and carrying can be avoided by using conveyors, lift trucks, slides or hand trucks. For example, cartons can be slid rather than lifted off a pallet onto a conveyor by using a scissors lift to keep the pallet at the same height as the conveyor.

Reduce the weight or the force needed to move the load – Lifting, lowering and carrying can be made easier by reducing the number of objects lifted at once or by reducing the size of the load or container. Pushing and pulling can be simplified by reducing the load on a cart, using larger wheels or casters (and maintaining them), and keeping floor surfaces free of obstacles. Assigning two people to a job cuts the weight or force in half. But, this is rarely productive and should be used only on jobs done infrequently or when no other alternative is available.

Reduce the distance from the hands to the body – When lifting, lowering and carrying, the closer the hands are to the body, the safer the job will be. Do this by keeping the load small and providing grips or handles. Don't reach over objects—move obstructions out of the way.

Reduce the distance the load has to move – One way to get the best material handling results is to minimize the vertical and horizontal distance over which the material is handled. Shortening the distance the load is carried, pushed or pulled can also reduce the exposure to injury. Study the layout of your department to reduce distances between individual workstations and between workstations and storage. Conveyors

or lift trucks can also be used to shorten the carrying distance.

Keep material in the area between shoulder and knuckle height – This is the most efficient range for lifting and lowering. Each time a load is lowered, it introduces the necessity of lifting it later on. You can use stands, conveyors and scissors lifts to keep material at the proper height for working.

Where to Start

Here are some items to include in your material handling checklist.

Bending

- Eliminate the need to bend.
- Keep materials at work level.

Twisting

- Eliminate the need to twist.
- Keep materials in front of the worker.
- Provide sufficient work space for the *whole* body to turn.

Reaching Out

- Eliminate horizontal reaches over 16 inches.
- Keep the load close to the body.
- Reduce the size of objects that are handled manually.

Lifting and Lowering

- Reduce the weight of the load.
- Increase the weight to a point where it *must* be handled mechanically.
- Eliminate the need to lift and lower the load manually.

Pushing and Pulling

- Eliminate the need to push and pull the load manually.
- Lessen the force needed to push or pull the load.
- Keep ramps below a slope of 5 percent.

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- Provide firm grips and handles.
 - Reduce the distance of the push or pull.

Carrying

- Eliminate the need to carry.
- Reduce the weight of the load.
- Shorten the distance the load is carried.
- Carry the load with the arms straight down.

Training

Generic training in proper manual handling technique has not been shown to be particularly effective in reducing low back injuries. However, training specific to the job can have value if done sensibly—especially in combination with job redesign.

Encourage the use of comfortable or natural methods. When training your employees in manual handling, here are some important things to remember:

- *Avoid unnecessary bending* – handle loads at waist level whenever possible
- *Avoid unnecessary twisting* – move your feet
- *Avoid reaching out* – handle the load close to the body
- *Avoid excessive weights* – get help or use a handling aid
- *Lift slowly and smoothly* – avoid quick, jerky movements
- *Stay in good shape* – get proper exercise and diet

It is important that your workers also be instructed in the *specifics* of the type of manual handling they will be doing. This includes handling bulky, heavy or odd-shaped objects and the tricks that experienced workers have learned to lessen their exertion. Make sure to emphasize the proper use of each handling aid that you provide.

Notes

The illustrations, instructions and principles contained in the material are general in scope and, to the best of our knowledge, current at the time of publication. No attempt has been made to interpret any referenced codes, standards or regulations. Please refer to the appropriate code-, standard-, or regulation-making authority for interpretation or clarification. Provided that you always reproduce our copyright notice and any other notice of rights, disclaimers, and limitations, and provided that no copy in whole or in part is transferred, sold, lent, or leased to any third party, you may make and distribute copies of this publication for your internal use.