

## Back injuries: risk factors and controls

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### Introduction

Back injuries are a significant and costly injury problem in the American workplace. According to the Bureau of Labor Statistics (BLS), the back is the most frequently injured body part. In their most recent publication, back injuries accounted for 42 percent of the musculoskeletal disorder (MSD) injuries recorded throughout the United States. Various estimates put the total cost of these injuries in the multi-billion dollar range, and these costs do not reflect the additional indirect costs of an injury, such as production downtime, administrative expense, employee retraining and quality issues. Back injuries can be disruptive, painful and costly; but they don't have to be. They can be prevented.

### Risk factors

The risk factors for back injuries are well known and fall into two major areas. Those associated with the process and work activities over which the employer has a great deal of control and those of a more personal, individual nature, over which the employer has less control, but still some ability to influence.

On the process side, the major risk factors are awkward **posture**, high **force** and the degree of **frequency** and **duration** of the exposure. When people work or lift in awkward postures (e.g., bent or twisted back, extended reaching, etc.) they place much greater stress on their bodies than when working in a more relaxed or "neutral" posture. **Force** (i.e., the object weight) is the second major risk factor. How much weight the person lifts and from where it is lifted should be the second major concern. The greater the weight, the greater the risk is for injury. Also, the closer the object is to the floor, the greater the risk because of the need to bend over more, causing an awkward posture.

The next consideration should be the **frequency** and/or the **duration** of the lifting/moving activity and the exertion of force. More frequent lifting or a greater amount of time lifting and carrying reduces the amount of recovery time, so that the individual tires more easily and is more likely to develop an MSD. Other occupational factors include prolonged sitting, poor ergonomic workplace design and issues such as vibration, temperature extremes and slippery walking surfaces.

There are a number of personal risk factors that contribute to the potential for back injuries. Personal factors include poor physical fitness and a lack of exercise, poor posture, psychosocial factors and lifestyle choices, such as smoking and poor diet/nutrition, stress and prior back problems. Degeneration of the spine, due to aging, can be a major contributor to lower back injuries; however, BLS data indicates that most back injuries occur in people ages 25 to 54. While employers have much less control over these risk factors, they can influence the individual's behavior through education and wellness programs.

### Risk control program

When looking for ways to avoid back injuries, you should apply a hierarchy of controls. These controls fall into three broad categories. In order of preference they are: **Engineering**, **Administrative** and **Safe Work Practices**.

First, eliminate lifting whenever possible through the use of mechanical lifting equipment, such as a hoist, scissors lift, dolly or hand cart. Locate materials so they are lifted the fewest times and carried the least distance. Reduce the weight of fixtures, containers, tools and other objects handled on a regular basis.

Administratively control the exposure by breaking up material handling activities into multiple sessions. For example, unload half of the truck of incoming goods in the morning and the second half in the afternoon, or on a subsequent day. Having more than one person help unload the truck is another example of an administrative control.

Establish and train employees in safe work practices. Identify the proper methods for handling materials and make it easy for employees to follow them. For example, train people to use hoists and the handles on containers. When materials must be handled manually, ensure there is sufficient space and good housekeeping so that your employees can work in neutral postures and avoid tripping on things. Provide training in proper material handling practices.

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### Helpful lifting strategies

When materials must be handled manually, lifting strategies can help employees avoid putting undue stress on their back muscles or spine. Recommended techniques include:

- **Size up the load:** Take a few seconds to stop and think about the weight, how the load will be handled and where it will be set down. Is it within the individual's physical capability to safely handle it, and is there enough room to lift it without getting into an awkward posture?
- **Ensure that the path is clear, with ample room to maneuver and good footing:** Carrying an object is hard enough without worrying about tripping on electrical cords, boxes or other materials in the pathway. Make sure the floor is clean and not slippery. Employees should wear appropriate footwear that can help provide extra slip resistance.
- **Never allow the load to obstruct the view:** If people can't see where they are going, they are more likely to trip and fall. If the load is too big, take it in smaller portions.
- **Use a good lifting technique:** Bend the knees and use the legs, not the back, for lifting. Keep the chin up to help maintain the natural "S" curve in the back throughout the lift. Lift smoothly and comfortably, not jerking the load from a resting position into a carrying position.
- **Ideally, keep all loads between knuckle and shoulder height:** It is best to keep the lifting and carrying activities at a height where the load is between the individual's shoulders and knuckles when their arms are hanging at their side.
- **Avoid twisting and bending while lifting or moving:** Bending and twisting significantly increases the loading on the back. Do not put objects on the floor if they must be picked up later. When changing direction, the person should do so by first moving his/her feet and rotating his/her entire body in the new direction of travel.
- **Keep objects close to the body:** The farther away from the body a load is carried, the greater the stress placed on the lower back.
- **Avoid heavy lifts:** If the load is too much for one person, use a mechanical lifting/moving aid. When possible divide the load into smaller units that can be safely handled. If more than one person is lifting a heavy object, use extreme caution because the load will not be divided equally throughout the lift. Fully plan the lift and communicate clearly throughout the process.
- **If handles are provided on the load, use them:** Handles allow the load to be grasped with a power grip and help provide additional stability when lifting or moving the load.

### Personal behavior strategies

Employees can do many things in their personal lives to help reduce the likelihood of a back injury, including:

- Maintaining a good posture in all activities, including standing, sitting, driving and sleeping.
- Exercising regularly and strengthening abdominal muscles through exercise.
- Getting adequate rest, nutrition and reducing tension and stress in their lives.
- Applying the improvement techniques used at work to their lifting and moving activities off the job.

### Conclusion

A comprehensive back injury prevention program can help companies effectively control the potential risk factors and costs of back injuries. Best practice programs include the elimination or reduction of manually lifting and moving materials when possible and employee education, not only on lifting practices, but the application of the three control means. You are in the best position to educate and train your employees about back injury prevention, help them to understand how their backs work and how to prevent back injury through the ideas presented here.

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