

Developing Controls to Prevent Back Injuries

After individual jobs or tasks have been evaluated to determine the extent of the risk, controls need to be developed to prevent back injuries. A three tier hierarchy of intervention strategy for controlling workplace hazards, including back injury hazards, should be used. The three tiers are:

- Reduce or eliminate the hazardous conditions using engineering controls
- Make changes in work practices and management policies which are known as administrative controls
- Use personal protective equipment

Engineering Controls

The preferred approach to controlling risk factors for back injuries is by physically changing the workstation layout, work process, tools and objects being lifted. These changes are the most effective because they reduce or eliminate the underlying causes of back injuries. The best time to select engineering controls is during improvements and modifications to facilities and operations. Controls to reduce back injuries can be incorporated at the planning stage and new equipment can be purchased which reduces risk factors. Some important engineering control strategies include:

- Change the weight of objects being lifted. Either reduce the weight or make the weight so heavy that a mechanical lifting aid must be used.
- Change the way materials, parts and products are transported. These include use of mechanical lift devices and modifications to handles and hand holds.
- Change the process to reduce risk factors.
- Modify containers to reduce weights. This could include reducing the size of the container and/or reducing the weight of packaging materials.
- Change the workstation layout. This might involve adjusting heights and worker positions.

NIOSH Lifting Equation Controls

If the NIOSH Lifting Equation has been used during the job evaluation process, the lifting multipliers can be used to develop engineering controls to reduce the hazard of the lift.

- If the Horizontal Multiplier is less than 1.0, bring the load closer the worker.
- If the Vertical Multiplier is less than 1.0, raise or lower the origin or destination of the lift. Avoid lifts near the floor or above the shoulder.
- If the Distance Multiplier is less than 1.0, reduce the vertical distance between the origin and destination of the lift.
- If the Asymmetric Multiplier is less than 1.0, move the origin and destination of the lift closer together to reduce the angle of twist, or move the origin and destination farther apart so the employee must turn their feet and step rather than twist their torso.

- If the Coupling Multiplier is less than 1.0, improve the handholds of the objects.

Administrative Controls

Administrative controls are management dictated work practices and policies designed to reduce the risk of back injuries. Administrative controls do not eliminate the hazards and therefore are not as effective as engineering controls. Administrative controls require management and employee feedback and require close supervision to assure the practices and policies are followed. Common administrative controls include:

- Job rotation to limit the duration the lifting is conducted.
- Adjusting work schedules to reduce overtime or increase recovery time between lifting tasks.
- Modifying work practices by providing training in proper lifting techniques.
- Reducing the pace of lifting.
- Stretching or exercise programs.
- Implementing two-man lifts policies.
- Implementing weight-lifting limits.

Personal Protective Equipment

Personal protective equipment is the least effective control method since it relies on the individual to reduce the risk factor. Gloves can help protect hands when lifting objects that are hot or cold or that have sharp edges. However, gloves can decrease manual dexterity and make it harder to grip an object. Proper footwear can prevent back strains due to loss of footing or slips and falls.

Back Belts

Back belts have been widely used as a control for back injuries in the past but they are not typically considered personal protective equipment. Studies conducted by the Center for Disease Control (CDC) and the National Institute for Occupational Safety and Health (NIOSH) have shown that:

- There is no statistically significant difference between rates of back injuries among workers who wear back belts and those that do not.
- There is no statistically significant difference between back injury rates in facilities where back belt use is required and in facilities where back belts are used voluntarily.

Back belt use can lead to a false sense of security and employees may think they can lift more weight than they are capable of when using back belts. Back belts should not be given out to employees as a means of preventing back injuries. They should be worn only in special circumstances if an individual employee's medical provider suggests that one be worn.

Prioritization of Controls

In most operations, a number of jobs or tasks pose a risk for back injuries. These jobs and tasks should be evaluated and those with the most significant risk should be given highest priority. A number of factors should go into the determination of risk and priority of control implementation. These include those tasks with the highest risk factors and those that impact the most employees.

Selection of Control Method

When selecting a control the following criteria need to be evaluated.

- Will the control reduce the identified risk factors?
- Will the control add other hazards to the process?
- Will the control increase or decrease productivity?
- Is the control feasible from an engineering standpoint?
- Is the control affordable?
- Will the employees accept the controls?
- Can the control be implemented in a reasonable amount of time?
- Will the control require special training to implement?

Hold brainstorming sessions with engineers, maintenance staff, managers and production employees to generate ideas. Review the original design specifications for an operation. Equipment, tools, raw materials and other job aspects may have changed over time, which may have increased the risk factors for back injury. Look through equipment catalogs, talk to vendors and contact trade associations to get ideas for possible controls. Experts can also be contacted regarding technical issues.

A number of alternative controls should be developed for a specific lifting task. The various alternatives should be evaluated to come up with the best solution. Cost benefit analysis, return on investment and other financial tools can be used in making the determination of the best control.

Once specific improvements have been selected, test the new tools, equipment or work procedures during a trial period before implementation throughout the entire work area. This will help determine if the controls work as anticipated.

- Mock-up a workstation to see how the controls work.
- Use the mock-up station to train employees in the use of new tools and equipment.
- Bring the workstation up to full speed production.

During the trial period, improvements should be evaluated to determine their effectiveness. Do not make final decisions until after enough time has past for employees to adjust to the changes. There can be initial resistance until employees get used to the changes. Expect to try improvements, see how they work and modify as needed.

Evaluation of Controls

A good way to determine whether the risk factors for back injuries have been reduced is to go back and use the same evaluation tool used initially.

- Have the risk factors for low back injury been reduced?
- Are there less complaints of fatigue and discomfort and have injury rates been reduced?
- Have the controls been implemented in a reasonable amount of time?
- Have employees accepted the controls?
- Have rates of turnover and absenteeism been reduced?
- Have there been increases in productivity and efficiency?

Periodically check on the operation to evaluate long term effects of the changes.