

RiskTopics

Minimizing lower back injuries caused by lifting, pushing and pulling

This RiskTopic provides tips for evaluating work tasks and activities in order to minimize lower back injuries.

Introduction

Contrary to popular belief, many of these lower back injuries are not the result of sudden mishaps that damage spinal discs or strain muscles and sprain tendons and ligaments. Rather, these injuries may develop gradually over a period of weeks, months or even years as a result of repeated stresses on the back. Overexertion and bodily reaction represent approximately 34% of occupational injuries. Workers' compensation injuries involving the lower back cost on average about \$39,000.¹

Discussion

Risk Factors

The five major "risk factors" or sources that may be individually, or in combination, related to the development of lower back injuries are force, repetition, duration, posture and shape and design of the object.

There are two types of controls: administrative and engineering. Administrative controls include items such as training, job rotation, shift/break schedules and careful selection of workers. Engineering controls include redesign of the job, a tool or a workstation. Ideally, engineering controls are the controls on which you should focus.

Good job design reduces the worker's exposure to the hazards of lower back injuries. It also reduces the medical and legal problems of selecting the worker for the job, as well as finding replacements for absent workers. Good job design also places less reliance on the worker's willingness to follow safety procedures.

This guide will help you identify risk factors and choose control options. Keep in mind that lower back injuries may be the result of more than one risk factor. Your chance of minimizing low back injuries improves by controlling as many risk factors as possible.

Guidance

The best way to use this document is to:

1. Observe the task being performed.
2. Consider each identifying risk factor and determine how these factors relate to the job or task.
3. Identify the effects of performing that task in the current manner. Examples: strained back, pinched fingers, object dropped on foot causing foot injury or damaged product.
4. Review and choose the appropriate control. Please understand that these factors and controls cannot possibly be all-inclusive. Feel free to use your knowledge, creativity and judgment in utilizing this information.

A sample evaluation form is included in Appendix A. This may assist in data collection by allowing the division of the work task into its various components (hazards) and then review these components by risk factor and possible control technique.

Identifying risk factors for lifting, pushing and pulling

Force

Do you have any jobs requiring a worker to lift, push or pull weighted objects?

Some examples include:

- Sliding materials, containers or boxes to the front or rear of pallets
- Use of hand jacks
- Pulling containers off of storage racks
- Picking up dropped parts
- Cleaning up workstations
- Lifting items off of pallets or floor

Repetition

Do you have any jobs requiring a worker to move objects over and over?

Some examples include:

- Frequently moving materials in and out of the working area of the machine
- Frequently picking up and sorting materials
- Frequently moving materials from storage to shelving

Duration

How much time is spent lifting, pushing or pulling?

Considerations include:

- This is the worker's full-time job every day.
- It is done frequently over an eight hour shift.
- It is done occasionally throughout the shift.

Shape and design of object

Is it difficult to handle or move your materials?

Considerations include:

- The objects moved do not have handles or hand grips.
- The hand grips are poorly placed.
- The objects handled are awkward and difficult to grasp.

Posture

Do any workers twist or bend while moving objects?

Some examples include:

- Reaching away from the body to the front or sides
- Bending to lift objects from the floor
- Bending at the waist to lift objects
- Moving objects to above shoulder height

Note the risk factors identified in the Identifying/Loss Drivers columns of the worksheet.

Consider possible control options for the lifting, pushing and pulling risk factors

Force

Increase the weight to necessitate mechanical handling:

- Bags with greater weight
- By packaging many objects together
- By changing the size of the object

Reduce the weight by decreasing

- Size
- Container capacity
- Load in the container
- Container weight
- Number of objects being handled at the same time
- Purchase materials in less than 50-pound containers

Repetition/duration

Eliminate the need to handle manually.

Use mechanical devices whenever possible.

Reduce repetitions

- Cross-train workers to keep them from doing the same task over and over
- Rotate workers between job stations frequently
- Broaden jobs to use different muscles

Shape and design of object

- Reduce the size of the container
- Add handles that will aid in grasping
- Encourage grasping and carrying objects with two full handgrips instead of just using finger grips

Posture and technique

Bending

- Keep materials at waist level during processing
- Use mechanical devices to raise items to about waist level

Twisting

- Keep materials in front of worker
- Provide swivel seats
- Use mechanical devices to change material flow direction
- Allow enough space to turn and step into work area

Reaching

- Reduce the size of the object
- Place items (materials, tools, controls) as close to the worker as possible
- Allow space to walk around and get closer to objects
- Pad conveyor edges to allow workers to stand closer

Note possible control possibilities in the Controlling column of the worksheet.

Conclusion

There are a wide variety of risk factors that may contribute to lower back injuries. These injuries may be avoided by analyzing the risk factors and implementing controls following the guidance in this RiskTopic. Control methods may include a combination of both administrative controls and engineering controls discussed. An example worksheet showing the analysis of a fictitious job task is included in Appendix B.

References

¹ National Safety Council. (2017). *Injury Facts®*, 2017 Edition. Itasca, IL: Author.

Appendix A

Analysis worksheet

Department _____

Date _____

| Hazards (jobs) | Identifying | Loss drivers/root causes | Controlling |
|----------------|-------------|--------------------------|-------------|
| | | | |
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Appendix B

Analysis example

Department _____

Date _____

| Hazards (jobs) | Identifying | Loss drivers/root causes | Controlling |
|---|--|--|---|
| Receiver unloads trailer at dock; places cargo on pallets | Weight (20 to 60 lbs.) | Back/shoulder sprains, could drop item on foot, item could break | Weight: Suppliers place cargo on pallets or reduce carton weight |
| | Repetition Five cartons per minute | Same | Repetition: Mechanical assist or rotate worker |
| | Shape/Design: Large cartons; difficult to hold | Same | Shape/Design: Smaller cartons, cartons with handholds |
| | Posture Twisting to pallet | Same | Technique: Turn whole body, raise pallet, rotate pallet |
| | Bending to floor level; reaching across pallet | Same | |

Sample

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